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LONDON SATURDAY JANUARY 5 1946

THE SURGERY OF ARTERIAL DISEASE AND INJURY*

BY

Prof. J. PATERSON ROSS, M.S., F.R.C.S.

The early diagnosis and treatment of arterial injuries have been well described in the Medical Research Council's War Memorandum No. 13, but with the end of the war the problems of peripheral vascular disease will again become the more important, and therefore I intend to consider them first. I would like to make it clear from the start that they are not so intricate that only the specialist, working with a highly trained team at a special centre, can hope to understand them and to undertake the treatment of vascular disease. It should be the duty of those occupied in clinical research to correlate the results of their elaborate investigations with clinical methods of observation, so that the practitioner may be able to form a pretty accurate estimate of the nature and extent of the disease he has to treat. The surgical specialist should aim at simplification and standardization of technique, so that it may be easy for others to follow his lead, and thus the advances in surgical treatment may become widely known and practised.

Difficulties must arise when unusual features present themselves, and it is under such circumstances that the experience and judgment of the specialist are required in the selection of the patients who are likely to benefit from surgical treatment.

Raynaud's Disease

It is now customary to refer to any condition in which coldness and cyanosis of the digits occur on exposure to a moderately low temperature as the "Raynaud phenomenon." It may be seen in association with any form of obliterative or degenerative arteritis, it may be secondary to pressure by a cervical rib, or it may follow frost-bite or injury from the use of vibrating tools. It is unfortunate that Raynaud himself did not describe a single clinical entity, yet there is a clearly defined condition to which the term Raynaud's disease should be limited. It is characterized by colour changes in the digits produced by cold, occurring in attacks which show a rapid onset and recovery, and affecting the extremities symmetrically. The peripheral pulses are preserved, and if there is any loss of tissue it is never more than shallow ulceration close to the finger-tips: true gangrene is extremely rare. The disease is seen almost exclusively in the female sex—in fact, if a male patient presents a similar picture it is likely to be an early stage of obliterative arteritis and not Raynaud's disease.

A patient who suffers from Raynaud's disease in this country will be relieved of her symptoms by going to live in a warm climate, and even a change of occupation so as to avoid local exposure to cold will produce some improvement. We have not found emotion to be a common exciting cause of attacks; neither is excessive sweating of the extremities at all frequent in our experience. For these and other reasons we follow Lewis's teaching that the disease is due to a local fault in the small arteries, and not to a central affection of the sympathetic nervous system. Furthermore, it must be pointed out that by the term "local fault" Lewis did not mean that even in mild Raynaud's disease there is some structural change in the vessels; the fault is an abnormal sensitivity to local cooling.

On the other hand, it can be shown that the more severe forms of Raynaud's disease are complicated by structural changes in the arteries—obliterative arteritis and thrombosis—and this is the most important of the factors determining whether a patient is likely to benefit from surgical treatment. In the mildest form there are only colour changes in the digits, and the arteries are still able to dilate rapidly and completely as the attack passes off. There is an intermediate group of moderate severity complicated by shallow ulceration of the finger-tips, in which vasodilatation occurs more slowly and is incomplete. In the most severe group, which shows sclerodactyly or hypodermolithiasis in addition to the other manifestations of Raynaud's disease, structural changes in the small arteries may prevent vasodilatation, so that the response to vasomotor inhibition or paralysis may be identical with that seen in advanced arteriosclerosis.

In Raynaud's disease the stimulus of cold almost obliterates the lumen of the digital arteries. After section of the vasomotor nerves their lumen is permanently increased, so that the same stimulus, while still reducing it greatly, does not arrest the circulation completely. The very different response to cold after sympathectomy in a person with normal vessels and in a patient with Raynaud's disease is further evidence in favour of the view that the vessels themselves are peculiarly susceptible to stimulation by cold.

It is clear, however, that unless sympathetic denervation is complete, vasodilatation will be inadequate, and the possibility of the obliteration of the artery by cold will persist. The importance of this factor is demonstrated by patients who show a good result in one hand and a poor result in the other after what were intended to be identical operations on the two sides. Anatomical variations in the origin and distribution of sympathetic rami are well known, and it is therefore essential to plan our operations so that there is the least possible risk of missing a few of them. It must not be forgotten that nerve impulses are mediated by chemical substances liberated at nerve endings, and widespread contraction of muscle may therefore result from the sparing of single nerve filaments.

For this reason we now favour the posterior approach to the upper thoracic sympathetic trunk as modified by White and Smithwick (1942). Though the anterior approach as modified by Telford (1935) can achieve the same object in skilled hands, the less experienced are likely to find the posterior approach a simpler operation, and resection of the medial ends of the second and third intercostal nerves is a good safeguard against sparing any anatomically abnormal filaments.

It will be noted that these operations are designed to make a preganglionic section of the vasomotor supply to the arm. Removal of the second, third, and fourth lumbar ganglia, the usual operation for sympathetic denervation of the lower extremity, is a purely preganglionic section for the foot. It is well known that the sensitization of sympathetic nerve endings to adrenaline is less after preganglionic than after postganglionic section; and as this sensitization plays a part in restoring a degree of vasoconstriction and so producing "recurrences" after operation for Raynaud's disease, the importance of planning a preganglionic operation is manifest. The uniformly better results obtained by operation for Raynaud's disease of the feet are often accounted for entirely on the ground that the lumbar operation is preganglionic, whereas in the thoracic operation some postganglionic elements also may be damaged. But it must be remembered that the disease

* From the Surgical Professorial Unit, St. Bartholomew's Hospital. A lecture given at the Royal College of Surgeons of England, Nov. 29, 1945.

is never as severe in the foot as in the hand. Ulceration and sclerodactyly of the toes are almost unknown.

It is often said that sympathectomy is effective only for a few months or a year, suggesting either that nerve regeneration is the rule or that the peripheral remnants of the sympathetic can function independently. But the sympathetic denervation following a well-planned and correctly executed operation is permanent, as shown by sweating tests in addition to vasomotor reactions. In progressive structural disease symptoms may persist and increase in severity; certain organs may be capable of acting without nervous control; but these manifestations must not be misinterpreted as evidence of failure of sympathectomy. They show that there may have been an error of judgment in selecting patients for operation, and so far as Raynaud's disease is concerned the predominant consideration must be the severity of the disease. Milder forms react favourably to sympathectomy: the operation is often futile in the presence of complications, especially sclerodermia.

Obliterative Arteritis

Structural disease in the arteries of the leg is of many varieties with many different causes, ranging from injury to thrombo-angiitis and arteriosclerosis—presenile, senile, and diabetic. But whatever may be the aetiology, it is the level of the block in the arterial tree which determines the clinical picture and the value of sympathectomy in its treatment. This important fact was demonstrated arteriographically by Boyd in 1938, yet it is still commonly taught that in any form of obliterative arteritis the disease runs a progressive course characterized by intermittent claudication in the early stages, followed later by rest pain.

Actually three clinical groups may be recognized. In one a main vessel such as the femoral or more commonly the popliteal artery is thrombosed and the presenting symptom is intermittent claudication in the calf muscles. Though the foot may be appreciably colder than the other—for the disease is often unilateral—the nutrition of the skin of the foot remains good and gangrene does not occur, since the proximal vessels alone are involved and an adequate collateral circulation develops to keep the distal vessels supplied. It must be noted that if the posterior tibial artery is blocked in this way intermittent claudication in the muscles of the sole of the foot is the result, but may be mistaken for "foot strain."

When the popliteal artery is thrombosed the sural arteries supplying the gastrocnemii are likely to be permanently blocked, causing irreparable damage because of the poor anastomosis within the muscle itself. It is therefore not surprising that sympathectomy is of little or no value for claudication arising in this way. If, however, the block is in the external iliac or femoral arteries the outlook is much better, since the post-operative improvement in the collateral circulation at the level of the block provides a considerable increase in the blood flow to the calf and we have had enough experience to convince us of the great value of sympathectomy in these more proximal blocks.

The diagnosis can be made by anyone who has learnt to feel the pulse in the popliteal artery. This is too often regarded as a difficult examination and is therefore neglected. All the pulses in the leg—femoral, popliteal, posterior tibial, and dorsalis pedis—must be felt for as a routine examination. More accurate information is obtained by oscillometry, but this is rarely required for diagnosis: it is of much value in assessing the severity of the disease, and is therefore useful for prognosis.

The intensity of postural colour changes in the foot, and the rate at which superficial veins refill after they have been emptied by elevating the limb, are helpful in indicating the degree of arterial obstruction.

These simple clinical methods usually provide all the information required to make a decision for or against sympathectomy, but brief reference must be made to the more complicated tests with local or spinal analgesia, and to arteriography. Spinal analgesia produces vasomotor paralysis, but the local blocking of sympathetic trunks with procaine has the advantage that muscle power is preserved, and so it is possible to test the effect upon claudication by getting the patient to carry out repeated movement against resistance under controlled conditions before and after the injection.

The duration of the sympathetic paralysis in these tests is brief, and whereas a good response is an argument in favour of operation, a poor response should not be sufficient in itself to deny a patient any chance of relief by sympathectomy. The improvement in collateral circulation which accounts for any post-operative improvement in the limb is a gradual process, and this explains the well-known fact that the results of sympathectomy for obliterative arteritis are usually better than tests by temporary nerve-blocking might lead us to expect.

It is often said that it is only when spasm is an important factor in the disease that sympathectomy is worth while. But an improvement in the blood flow after spinal analgesia is not evidence that spasm has been relaxed, for it is the reaction produced in any normal individual. It really means that the arteries are capable of relaxing fully when vasoconstrictor impulses no longer reach them, and a poor response indicates that the structural changes of degeneration or inflammation interfere with this normal reaction. No doubt spasm does play a part in obliterative arteritis, but its importance has been greatly exaggerated.

Another disturbing dictum is that sympathectomy is contra-indicated for claudication because, if the operation is successful and the circulation in the skin is improved, there must necessarily be a corresponding impairment of the deep circulation to the muscles. There is experimental evidence that sympathetic impulses are vasodilator to the arteries of skeletal muscle, and this provides a strong theoretical argument against sympathectomy for claudication. We have enough practical experience, however, to show that the operation is often beneficial, and our disappointments are to be explained by the obliteration of certain important muscular branches. Arteriography is the only pre-operative examination which can give us information on this point, but it must not be assumed that this test is often necessary, as the decision about operation can usually be made without its aid.

In the second clinical group the distal arteries, of the size of the plantar arch and its digital branches, are principally affected, and the characteristic features are pain in the foot at rest, often worst in bed at night, and nutritional changes in the skin—discoloration, ulceration, and gangrene. When dependent the toes or the whole foot are of a reddish-blue colour, and they blanch when elevated above heart level. Permanent discoloration of the affected parts heralds the onset of gangrene. The pulse in the main vessels, at the knee and even at the ankle, may be present, and under such circumstances there is an abrupt drop in the surface temperature at the level of the arterial obstruction.

Sympathectomy can achieve a great deal in this distal group—the intense pain is often abolished, and if it persists it is because gangrene has already been established. The improvement in the circulation in the foot after two or three weeks may be sufficient to permit the successful local amputation of toes; and if the stump fails to heal and pain recurs we know that a major amputation is necessary, though it may be done below the knee.

In the third group there is widespread narrowing of the lumen throughout the arterial tree. Rest pain follows closely upon intermittent claudication, and gangrene of the toes occurs with loss of the pulse in the main vessels at the knee or at the groin. Under such circumstances sympathectomy is useless, and amputation above the knee becomes inevitable.

Arterial Injuries: Early Treatment

For small lacerations simple suture may be effective, and if it is available fibrin foam is valuable in strengthening the repair. For more extensive wounds, in which suture would narrow the lumen unduly, complete division with axial anastomosis, or the re-establishment of the stream using a cannula or vein graft, is preferable to complete division and ligation of each end, though the last may be the only possibility under conditions of stress. It is unfortunate that so often the conditions under which the wound has to be treated preclude any long and delicate procedure requiring special apparatus. The attempt to restore the lumen, even if it succeeds only for a short period, may be of the greatest value if it gives time for the establishment of a collateral circulation before the vessel finally becomes blocked.

It must always be remembered that, if the artery has to be ligated, double ligation by itself is not enough—in fact, it is dangerous because the longitudinal tension in the artery increases the risk of secondary haemorrhage. The damaged segment must be excised, and not for this reason alone, since it may set up spasm in the peripheral arteries. Excision may be regarded as the most radical form of periarterial neurectomy, which explains the post-operative improvement in the colour and temperature of the limb.

These remarks also apply to contusion of an artery such as may follow a "near miss." It may be a difficult matter to determine whether an artery is constricted because it is bruised or merely because it is in spasm, from which, of course, it may recover within 24 hours. If there is much discoloration it is more than likely that intimal damage will cause thrombosis, and it will usually be wise to excise the damaged portion. If in such a case it is decided to postpone excision because blood is still flowing through the constricted part of the artery the surgeon should be prepared to reopen the wound within 12 to 24 hours if there are no signs of improvement in the peripheral circulation. By this time the appearance of the vessel should indicate clearly what ought to be done.

When an artery has to be tied soon after an injury we would follow Makins's teaching and tie the companion vein. Reference will be made later to the inadvisability of tying the vein in the later stages.

Should sympathectomy be performed—or at least injection of the sympathetic supply with local analgesic solution or alcohol—to encourage collateral circulation after the sudden block of a large artery? There are animal experiments to show the value of sympathectomy under such circumstances, gangrene being greatly limited in extent or avoided altogether. There is also much clinical evidence of the value of sympathectomy as a preliminary to ligation of a main vessel, such as the popliteal artery, which is known to carry a serious risk of gangrene. But the assessment of sympathectomy after wounding of a main artery is a different matter, and we must await the full report of the Army's forward surgical teams before drawing any conclusions. My own experience of a few patients upon whom sympathectomy or injection had been performed shortly after wounding was unfavourable, but there may have been many successfully treated at the front who were therefore never sent to a vascular centre at the base.

There are, however, many other measures which should be taken to give the best chance of survival to a limb threatened with gangrene. The most simple, and perhaps the most important, is attention to the position of the limb. If it is too much elevated it will become pale and cold, because of the free drainage of blood out of a limb which has a very limited supply. If it is allowed to hang down it will become cold and blue from venous congestion. In both of these positions pain may be severe, but an optimum position may be found which is most comfortable, and in which the limb is warmest and of the best colour—it is usually with the limb extended at or just above heart level.

Reflex vasodilatation of collateral vessels may be brought about by heating the trunk and the healthy extremities, but the affected limb must be kept cool—either exposed to room temperature, or even cooled by a fan or ice packs. Warming a limb increases the local tissue metabolism and therefore the demand for blood; cooling has the opposite effect, and thus tends to reduce the need for oxygen to approximate to the amount which can be supplied by the impaired circulation.

Rapid transfusion of a pint (473 c.cm) of blood may have the effect of forcing open collateral vessels, and is naturally especially valuable after severe blood loss.

Traumatic Aneurysm and Arteriovenous Fistula

In managing these later results of arterial injury it is most important to bear in mind that the safety of the limb depends upon delaying operation to provide time for an adequate collateral circulation to develop. As a rule there is no difficulty about waiting for three months or more when there is a fistula, since the force of the arterial pulse can diffuse easily into the open vein without much, if any, increase in the size of a false aneurysm sac. But with an injury which is purely arterial it happens not infrequently that a steady increase in the size of the false sac, and in the severity of pain, necessitates intervention at an earlier date. In our own limited experience I have been forced to operate upon one brachial and three axillary false aneurysms within a month of wounding.

This experience has brought it home to me that the usual description of the production of a traumatic false aneurysm does not cover all of them. It is said that the haematoma which forms immediately upon the arterial wound becomes hollowed out like a cup, the original clot thus forming the wall of the sac. When this happens the wall must be fairly substantial, and when organized should provide a strong fibrous barrier against the arterial pressure. Fresh layers of clot would form within the sac, so that spontaneous cure of a small aneurysm may follow. I believe that I have seen this occur in two of our soldiers.

But the aneurysms which demanded early operation gave clinical signs of having thin walls which yielded alarmingly to the pulse beat, and when they were opened there was a central mass of blood-clot surrounded by fluid blood within the very thin and imperfect sac wall formed by the surrounding muscle and connective tissue. I wonder how frequently this may be the state of affairs in traumatic false aneurysms: I suspect more frequently than current teaching would lead us to expect.

The definitive treatment of a traumatic aneurysm is extirpation of the sac whenever this is possible, but for the brachial aneurysm and two of the axillary aneurysms which required earlier operation I performed proximal ligation as close as possible to the aneurysm as a preliminary measure ("immediate proximal ligation"). This was done to reduce the size of the swelling, which threatened to rupture and also compressed neighbouring collateral vessels, to give further time for the development of a collateral circulation, and to facilitate the direct approach to the aneurysm itself three or four weeks later. For one of them—an aneurysm of the third part of the axillary artery—I combined the preliminary ligation with upper thoracic sympathectomy. The nutrition of the limb did not suffer, nor was the second stage of the operation rendered more difficult by the first stage of this double procedure.

Before deciding upon proximal ligation, however, it must be clearly established that the lesion is purely arterial, for this operation carried out on an arteriovenous fistula is fraught with grave danger and may be disastrous, because the ligature interferes seriously with the developing collateral circulation at the level of the fistula, without impeding in any way the too easy return flow of blood into the veins. The danger was well illustrated by a patient transferred to us after ligation of the external iliac artery for a large varicose aneurysm of the femoral artery which also involved the origin of the profunda. As soon as he had recovered from the anaesthetic he was found to have an external popliteal nerve palsy and a cold painful foot which showed all the manifestations of severe ischaemia, though gangrene fortunately never became fully developed.

Diagnosis of Arteriovenous Fistula

An arteriovenous fistula can be recognized by the character of the bruit which is heard over it and is conducted for great distances proximal and distal to it. It is a continuous whirring clattering sound with a systolic crescendo, and well deserves its common designation of "machinery murmur." This should be sufficient in itself to distinguish a fistula from an arterial aneurysm with its systolic bruit.

There are many other associated signs, of which tachycardia and an increase in pulse pressure, owing to a drop in the diastolic blood pressure, are usually the first to be recognizable. The increase in pulse rate may not be noticed until the remarkable slowing of the pulse which follows obliteration of the fistula by digital compression has been observed. Only one of our 34 arteriovenous fistulae was associated with a cardiac murmur, and overfilling of superficial veins was rarely seen: these would appear to be later developments. All of our patients showed some degree of enlargement of the heart, though very few were reported by the radiologist to be beyond the normal limits; the heart decreased in size in every one after closure of the fistula, yet it is clear that the diagnosis cannot be made by this method. The blood volume also was less after

closure of the fistula in every patient thus examined; but although it is possible in the end to say that the blood volume was shown to be increased on the average by about 15%, as the "normal" blood volume of a given individual is not known the pre-operative figure can scarcely be expected to provide evidence of a fistula.

It is much more difficult to decide where the fistula is and what vessels are involved. The loudness of the bruit is deceptive, and the determination of the point where pressure will abolish it may not be an accurate guide, because compression of the main vessel proximal to the fistula can give the same result. Arteriography, which is a great help when a main vessel is obstructed, usually fails to give a clear picture of a fistula, especially if it is large enough to allow the opaque material to diffuse rapidly into the vein. The track of the missile as shown by a through-and-through wound or a retained foreign body is often the best guide. But the decision usually has to be made by guesswork, and over and over again one has felt that the whole undertaking would have been so much simpler had one started with the information which has to be gathered in the course of the operation.

Treatment of Arteriovenous Fistula

We learnt that for safety it is necessary first to pass controlling tapes round the artery and vein involved as near as possible above and below the fistula without opening into it. In a bullet wound this may be comparatively simple, but as most of the wounds were caused by fragments of mortar shell or bomb, and as there had clearly been widespread haemorrhage with subsequent scarring inside and outside the vessel sheath, it was often a tedious dissection to clear the required length of the artery without damaging branches which were needed as collaterals. For the same reason it is often difficult to find healthy enough vessel wall to hold sutures, especially with varicose aneurysms, and I often felt humiliated by my lack of enterprise, for we were commonly reduced to quadruple ligation instead of carrying out the various forms of arterial reconstruction which we had hoped to attempt. On the other hand, it must be admitted that the results obtained by this "old-fashioned" method were not unsatisfactory.

We carried out lumbar ganglionectomy two to three weeks before all our operations for arteriovenous fistula in the lower extremity, with the single exception of a fistula between the peroneal artery and vein. We did this partly because our series was intended to link up with that of Lieut.-Col. A. M. Boyd, and I understood that this was also his practice; partly because, even in spite of waiting for a collateral circulation to form, damage might be done to it in the course of the dissection of the lesion, and the best possible collateral circulation therefore seemed to be desirable; and partly also because I knew that at other centres these fistulae were being treated without sympathectomy and I hoped our series might form part of an interesting controlled experiment. It may yet appear that we were unnecessarily over-cautious, but we never saw anything approaching gangrene of a toe. It would be wrong to draw conclusions from our small numbers—1 common femoral, 3 superficial femoral, 5 profunda femoris, and 7 popliteal lesions—but they all recovered with good function. The most critical was in the man who had already had his external iliac tied in continuity for a common femoral arteriovenous fistula: after a preliminary lumbar ganglionectomy I was forced to do a "triple arterial" ligation of his common, superficial, and deep femoral arteries, yet six months later he was able to walk four miles without pain, his residual disability being due to the ischaemic palsy of the external popliteal nerve, which was steadily recovering.

While quadruple ligation was in our experience the usual treatment for arteriovenous aneurysm, it may be possible to vary the procedure for aneurysmal varix. The scarring is less as a rule—no doubt the direct opening of the artery into the vein serves to limit the amount of blood extravasated into the surrounding tissues—and the dissection of the lesion is more straightforward. In two popliteal fistulae after the vein had been tied above and below the fistula it was possible to narrow down the communication till it could be safely ligated as though it were a branch of the artery, and thus the artery itself was spared.

Syndrome of Venous Obstruction

We were rather surprised, however, to note that these patients whose popliteal artery was preserved at the cost of the vein were less comfortable than those who had had both vessels blocked by quadruple ligation. They complained of aching pain and a bursting feeling in the lower leg, ankle, and foot produced by lowering the leg, which was more severe in the standing than in the sitting position, though sitting in one position for an hour or so may be almost intolerable. The pain may be relieved by walking for a short distance, but the quickest and most effective method of easing the pain is by lying down with the legs raised above "heart level." Swelling round the ankle may accompany the pain.

We came to recognize these symptoms of venous obstruction in many patients after injury or operation, but we also noticed that they are more marked when the arterial supply is unimpaired. Being persuaded that when ligating an artery immediately after an injury simultaneous ligation of its companion vein is advisable or is at least harmless, it took us a long time to realize that the different conditions under which ligation is undertaken at a later stage may call for different treatment. We had thought, with others, that in the treatment of an arteriovenous fistula, while immediate proximal and distal ligation of the artery would be sufficient to stop the vicious circulation, the additional ligation of the vein would be better (Maybury, 1945).

But the recognition of these symptoms as those of venous obstruction made us think again, and we were able to put the matter to the test in two fistulae—one between the profunda femoris artery and the common femoral vein, and the other between the superficial femoral artery and vein. For both of these we ligated the artery as close as possible above and below the fistula but left the vein intact. Neither of the patients complained of any of the symptoms of venous obstruction, and both had an adequate peripheral arterial supply. It is therefore our impression that the collateral circulation resulting from an arteriovenous fistula safeguards the arterial flow to the limb after ligation of the artery, and that it is a distinct advantage to preserve the vein whenever this is possible.

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OBSERVATIONS ON CASES OF STARVATION AT BELSEN*

BY

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Belsen was a detention and not an extermination camp—that is to say, not a camp where organized extermination was carried out. Originally devised for perhaps a few thousand people, it became progressively more overcrowded in the early part of 1945 as the Allied armies closed in from west and east and forced the Germans to evacuate other concentration camps. At its peak it is said to have contained over 66,000 persons. The majority of these were Jews of Polish or Hungarian origin, but almost all countries and religions were represented. Many of the patients had spent only short periods in Belsen, having previously been interned in other concentration camps, such as the notorious one at Auschwitz. However, the following notes, based on information given by a Hungarian woman doctor who was in Belsen for four months, convey some idea of the diet on which they had existed before the liberation of the camp.

In Jan., 1945, there was already very little food, but the quality was not so bad. Each person got one-sixth of a loaf a day (the loaf was black and weighed about 1.4 kg.), and sometimes potatoes and pieces of meat. For instance, there was occasionally a thin slice of sausage for supper and a little meat in the soup. On Sundays tinned meat was distributed; 12 persons shared one tin. By February everybody was getting

* An abstract of a report to D.M.S. 21 Army Group.

thin and the epidemic of typhus started. From then onwards the food steadily deteriorated. For a time they received soup on three nights a week and a little margarine or jam on the other four nights (only one-twelfth of a loaf each during March and no bread at all in April). When there was no bread they were given mangel-wurzels, so that sometimes supper would consist of mangels and margarine. For the last fortnight before the camp was relieved (i.e., for the first fortnight in April) mangel-wurzels were the only food. These were distributed in a form of soup, sometimes made from flour and salt, sometimes from neither. During this final period each internee was getting about a half-litre of this soup a day and nothing else. It is evident that throughout the last weeks of the camp's existence a gruesome form of the law of the survival of the fittest was in operation. The distribution of food was arbitrary, and those that still had some strength left obtained more than their share. An idea of the general conditions prevailing during the few weeks before the arrival of the British may be gained from the official statement that 10,000 unburied corpses lay among the living when the camp was first reached by them.

The original concentration camp, where the thousands of internees lay in crowded huts, was gradually evacuated between late April and the end of May. During this time innumerable seriously ill patients had of necessity to await their turn and to remain in the huts for a further period of days or even weeks under most unfavourable conditions. The patients were first seen after they had been brought from the concentration camp, passed through the "human laundry" for disinfestation, and taken to beds in the barrack rooms that formed the "hospital" accommodation. The following description of the clinical state is based on the appearance of patients in the middle of May—about four weeks after the first arrival of the British in the area.

A Typical Clinical Picture

The patient lay flat in bed without acute distress, yet with a miserable expression. He showed no interest in anything except his own needs, and appeared completely indifferent to the deaths that occurred so frequently. Moreover, death was a very public affair, since there were no screens and beds were crowded together. He talked with a whining voice and complained continually, usually of his severe diarrhoea. "Scheiszerei" was the commonest word. Second only to this complaint was unfavourable comment on the diet, the soup being blamed for the diarrhoea. Black bread was next in unpopularity. Patients who were a little less ill asked continually for white bread and complained that they were being starved. The truth was that there was enough food in terms of calories, but much of it was unpalatable. Although starving, they were extremely particular about their diet and very difficult to please. Most of them did not fancy sweet things, and almost all wanted solid food rather than soup. When they wanted a drink, lemonade or something sour was most often asked for. They were all sure that soup and cold food made the diarrhoea worse. Although milk was available as an alternative to the full diet, many of the patients didn't want it, and, if given it, complained that they were not getting enough to support life. Because of their poor appetite, many of them left their food untouched, and as there were insufficient nurses to feed them their state rapidly became worse. The orderly simply put the food beside the bed and left it. Later the untouched food would be collected if the patient had not secreted it in his bedding for future use. Fear of being without food was so great that even dying patients would put bread-and-butter and meat under their pillows.

All the seriously ill were incontinent of faeces, and their beds were continually soiled as there were not enough orderlies to change them, and, in any case, many of them had no sheets but simply lay on covered palliasses. Almost every patient when first seen had diarrhoea—varying from two to three loose stools a day to an almost continuous production of watery stools. In the latter cases a movement of the bowels invariably followed immediately after taking anything by mouth, so that the patient was afraid to eat or drink. The stools did not as a rule contain blood or pus. They were often light brown in colour, smelt offensive, and consisted of fluid and lumps of undigested food.

On examination the patient had an appallingly thin face. The eyes were sunken and the cheek-bones jutted out. These extreme changes made all the patients look alike, so that it became difficult to distinguish one from another. This difficulty was accentuated by the fact that all patients had had the bulk of their hair shaved off. The skin of their arms, legs, and anterior abdominal wall was often rough, dry, and scaly. There were large bed-sores on the buttocks and the lower part of the back. The ribs stuck out, and it was difficult to use a diaphragm type of stethoscope because it simply bridged across two ribs and made no contact with the skin dipping down in between. The anterior abdominal wall was concave, falling away from the ribs above and from the anterior superior iliac spine below. The greatest muscle-wasting was around the pelvis. The ischial tuberosities stood out prominently and the posterior surface of the ilium was almost devoid of muscle. There was a depression below the anterior superior illiac spine, and the skin hung down to the thigh in a fold. The legs were fuller owing to oedema; but this was often confined to the ankles and feet, so that a common appearance was of a leg as thin as a stick with a fat swollen foot on the end of it. .

The face and hands were pale. The conjunctivae were pale but otherwise normal. The sclerae were clear. The tongue was often red and smooth around the edges, but extensive changes were not seen. Koilonychia was not seen in a single case. Many patients had sore dirty mouths with gingivitis when they first arrived in the hospital area, but this condition cleared up in a few days without special treatment. Angular stomatitis was present in a small proportion of cases. The pulse was usually rapid (average approximately 100 beats a minute) and the blood pressure low, the average in 12 emaciated patients being 91/60. No abnormalities were discovered in the heart, apart from a reduced intensity of the sounds.

The average weight of 18 males who were strong enough to stand upright on scales was 44 kg. (38.7–59.7); 11 females averaged 35.3 kg. (25–45.5): i.e., males just under 7 st.; females about 5½ st. In 11 of these 29 the previous weight was known, and the loss was calculated as a percentage of the figure in health: the average loss was 38.8% (29–57%)—see Table I. The

TABLE I.—*Relation between Loss of Body Weight and (1) Haematocrit and (2) Serum Protein Concentration in 11 Subjects*

Case	Date	Body Weight (Kg.)			% Loss of Original Weight	Hmt. %	Serum Protein (g. %)
		Now	Originally	Loss			
M 42 ..	June 8	35·0	80·0	45·0	56	31·4	4·9
F 116 ..	July 5	25·0	50·0	25·0	50	36·8	5·0
Fx 1 ..	June 19	34·0	63·0	29·0	45	33·4	5·0
M 37 ..	June 7	39·0	67·0	28·0	42	23·0	4·8
F 114 ..	July 3	35·1	56·0	20·9	37	31·0	5·6
Fx 4 ..	June 19	39·9	62·0	22·1	36	33·2	3·7
M 35 ..	June 7	32·0	50·0	18·0	36	24·0	6·9
F 111 ..	July 3	31·0	47·5	16·5	35	20·2	4·5
F 124 ..	July 18	33·2	48·0	14·8	31	33·0	5·0
F 101 ..	June 8	33·0	47·0	14·0	30	27·5	5·8
F 4 ..	May 24	45·0	33·0	18·0	29	33·9	6·0

Average loss, all 11 cases: 38·8%.

N.B.—All above patients except M 37 and M 42 were non-tuberculous. No patient with more than a trace of oedema was included.

patients in this latter group were weighed at a comparatively late date (6 in June, 5 in July, and 1 in May), and, although all were very thin and at least one case of extreme emaciation is included (F 116), the figures do not on the whole represent the most severe cases. The thinnest patients died earlier and had been too ill to be weighed. As shown in the table, there was no correlation between percentage loss of body weight on the one hand and either haematocrit or serum protein concentration on the other.

Pulmonary Tuberculosis

Those who were free from pulmonary tuberculosis and had not reached the stage of extreme emaciation usually made rapid progress. They were soon able to eat almost any kind of food, and their diarrhoea diminished, although they continued to be very prone to loose stools and hurried evacuation of the bowels after meals. It was quickly realized that any patient whose progress was unsatisfactory was likely to have tuberculosis. During the last week in May it became possible to screen the chests of a few of those whose blood had been examined. Later some patients were transported to a static *x*-ray plant and chest films were taken. From this evidence and from post-mortem findings it was possible to say with some precision that certain

patients had tuberculosis and that certain patients were free from it. There were left some who were not *x*-rayed and who had no clinical signs of the disease.

Of 36 males 13 were free from tuberculosis, 7 were probably free, and 16 were affected. Of 28 females 9 were free, 8 were probably free, and 11 were affected. Thus, in all, the incidence of definite pulmonary tuberculosis in this series was at least 27 out of 64 cases, or approximately 40%, and it may have been higher. This incidence is of course in no way representative of all the victims of Belsen Concentration Camp, since many were never admitted to the hospital area. Furthermore, patients whose blood was examined were selected mainly on the grounds of being more sick than the average. On the other hand, some were selected for reasons irrelevant to their state of health—e.g., because they were doctors. All that this figure represents, therefore, is the approximate incidence of pulmonary tuberculosis among those who appeared rather more ill than the average. The incidence in those who died was probably considerably higher. Thus among 18 cases in which the cause of death was established an extensive tuberculous infection was present in 12.

crystalline haemin (81 mg. to a litre of N/10 NaOH) to make standards corresponding to 15.6 g. haemoglobin % (King *et al.*, 1937). The average density of these solutions, when checked against a standard grey screen, was found to be within 0.5% of that given by King *et al.* (3) Serum protein concentrations were deduced from specific gravities, using the copper sulphate method of Phillips *et al.* (1945). (4) Plasma volume was estimated by the dye dilution method, using Evans blue. A single blood sample was obtained 10 to 15 minutes after the injection of the dye. The dyed plasma was sometimes measured directly; in other instances the plasma was first treated to remove other pigments (methods of Crooke and Morris, 1942, or Morris, 1944).

Findings

(The majority of the estimations were made between May 14 and June 14—that is to say, within 4 to 8 weeks of the first arrival of the British Army in Belsen.)

Widespread Anaemia (see Table II).—75 starvation cases (36 males, 32 females, 7 children) were tested. Many of them were chosen because they were pale or oedematous or rather more wasted

TABLE II.—*Summary of Blood Findings*

Group	No. in Group	R.B.C. per c.mm.	Hb (%)	Hb (g. %)	Hmt. (%)	M.C.H.C., (%)	C.I.	M.C.V. (μ^3)	Serum Protein (g. %)
Starvation cases (males):									
Non-tuberculous									
Good evidence	9	3,403,000	62·2	9·7	30·9	31·4	0·91	91·4	5·6
Insufficient evidence	7	3,610,000	66·9	10·4	33·6	30·9	0·93	93·4	4·7
Tuberculous									
Pleural effusions only	5	3,450,000	61·4	9·6	29·8	32·2	0·89	86·6	4·8
Active pulmonary Tb.	9	3,380,000	60·1	9·4	29·8	31·8	0·90	88·6	5·4
Average	30	3,450,000	62·5	9·8	31·0	31·5	0·91	90·2	5·2
Starvation cases (females):									
Non-tuberculous									
Good evidence	8	3,310,000	60·2	9·4	29·3	31·7	0·91	89·0	4·3
Insufficient evidence	6	3,060,000	52·7	8·2	27·5	29·9	0·86	90·0	5·2
Tuberculous									
Active pulmonary Tb.	9	3,130,000	57·9	9·0	29·2	30·9	0·92	94·0	5·2
Average	23	3,180,000	57·3	8·9	28·8	31·0	0·90	91·0	4·9
Starvation cases (children)	7	3,520,000	61·2	9·6	29·9	31·9	0·87	85·5	6·0
Controls (healthy British males)	12	5,255,000	98·7	15·4	47·2	32·7	0·94	90·0	6·7

It was noted that some of the very frail patients remained afebrile despite tuberculosis—e.g., M 37, an extremely emaciated man of 50 years, whose temperature, taken twice daily for the last three weeks of his life, never exceeded 37° C., but who at necropsy was proved to have had active recent tuberculosis with cavitation. It was also frequently observed that patients coughed far less than would be expected from the extent of the pulmonary lesion, and several patients with active infection did not cough at all.

Typhus

The typhus epidemic in Belsen apparently started in February, and cases continued to occur until about the end of May. It was very difficult to discover in any individual cases whether or not a patient had had typhus, because so many had been desperately ill and weak for some time before the liberation and could not give any exact description of the kind of illness they had had. Weil-Felix tests were carried out in 48 cases: 21 were positive in a titre of 150 or more; 27 were negative or gave titres lower than 150. Of 26 of these tests made in May, 12 were positive; and of 22 made in June or early July, 9 were positive. Of 19 patients who said they had not had typhus 10 had negative and 9 had positive Weil-Felix reactions. Of 9 patients who said they had had typhus 5 had positive and 4 had negative Weil-Felix reactions. (I am indebted to Majors Griffin, Morris, and Prior for performing these tests.)

The general conclusion reached must be that the majority of patients in Belsen had recently had typhus.

Blood Examinations

Notes on Methods.—(1) All blood examinations were made on venous samples. (2) Haemoglobin was estimated as alkaline haematin; the majority of the measurements were made in a photo-electric colorimeter. Solutions were prepared from

than the average, but some included were less severe cases of starvation who later showed rapid improvement. With the exception of a few severely dehydrated patients (excluded from this series), all persons examined were found to be anaemic. Tuberculosis was evidently not the main cause of this anaemia, since there was very little difference between the Hb levels of the non-tuberculous and the tuberculous cases.

Haemoglobin Values.—The average haemoglobin in 30 males was 62.5%, in 23 females 57.2%, and in 7 children 61.2%. Almost all these observations were made between the middle of May and the middle of June (males, 19 in May and 11 in June—latest June 19; females, 17 in May, 2 in June, 4 in early July). One feature of the observations was the comparatively small scatter of the haemoglobin values. The following indices were calculated:

Group	No.	Mean Hb %	S.D.	Coeff. of Variation
Belsen males	30	62·5	7·3	11·6
Belsen females	23	57·3	9·3	16·6
Controls (males)	12	98·7	4·6	4·6

Characteristics of the Anaemia: Normochromic, Normocytic.—A striking feature was the absence of any evidence of iron deficiency. Thus the M.C.H.C. in a group of 30 males was 31.8% (lowest 29.4%), and in a group of 23 females 31.0% (lowest 26.7%). These averages do not differ materially from the average M.C.H.C. found in a group of 12 healthy British Army personnel—viz., 32.7%. Mean corpuscular volumes showed slightly larger variations than those of the control group; but average figures were normal—namely, 90.2 μ^3 in a group of 30 males and 91.0 μ^3 in a group of 23 females, compared with 90.0 μ^3 in the control group. The examination of stained films confirmed the absence of any significant change in average cell size, though some cases showed a rather greater degree of anisocytosis than normal. The features of normocytosis and normochromia of the erythrocytes suggest a simple diminution of production rather than any abnormality of maturation. This conclusion receives support from examination of the few marrow films that were made, on which Dr. J. F. Loutit reported as follows:

"Erythropoiesis is normoblastic, and so far as one can tell there is no maturation defect." The reduced metabolic rate which is known to prevail in starvation was probably one of the chief causative factors in this diminution of production, and doubtless in many cases infection of one kind or another had also contributed to a depression of bone marrow. The lack of correlation between haemoglobin and serum protein levels (see below) suggests that protein deficiency was not the main cause of the anaemia.

Reticulocytosis Present.—Reticulocyte counts were made on 20 patients who had been on a normal diet for at least five weeks but had received no iron or liver or other special treatment. The average was 1.6%. In 10 non-tuberculous subjects the average was 1.9% (range 0.6–3.6%); in 10 tuberculous subjects the average was 1.3% (range 0.5–2.4%).

Hypobilirubinaemia.—Although serum bilirubin estimations were not made, it was repeatedly observed that the sera were pale and often almost colourless.

Leucocyte Counts, including Differential Counts.—Only a few leucocyte counts were made; these were within normal limits. The height of the leucocyte column in the centrifuged haematocrit was measured in all cases. The average was 0.8 in 40 males and 0.9 in 26 females. In 12 normal soldiers the average was 0.8. In 7 of the 66 cases the column was less than 0.4 of a division. However, 5 of these 7 died within four days of taking the samples. There is therefore some evidence that leucopenia was not a striking or consistent feature of these cases of starvation.

Serum Proteins.—Total serum proteins were estimated in 43 cases. In 18 males the average figure was 5.2 g.%. In 19 females the average was 5.0 g. %. In the oedematous cases the levels were on the average lower than in the non-oedematous, although in many individual cases there was a lack of correlation between total serum protein concentration and degree of oedema (see Table III).

TABLE III.—*Relation of Serum Protein Levels to Oedema*

Group	No. of Cases	Average Serum Protein Concn. (g. %)	Range of Serum Protein Concn. (g. %)
Severe oedema	4	4·0	3·6–4·4
Moderate oedema	10	4·7	3·5–6·5
Slight oedema	13	5·1	4·5–5·9
No oedema	23	5·8	4·5–7·5

N.B.—Slight oedema was defined as oedema involving only the feet and ankles. Moderate oedema was defined as oedema involving the legs as well as the feet; in some of these cases the oedema extended to the lower part of the back; in others it did not extend above the knee. The term "severe oedema" was reserved for those cases which had generalized oedema involving the face. In all these cases the urine was either completely free from protein or contained at most a trace.

Lack of Correlation between Haemoglobin Values and Serum Protein Concentrations.—No correlation was observed between haemoglobin levels and serum protein concentrations. It is noteworthy that the average haemoglobin level was proportionately more depressed than the average serum protein concentration—viz., average haemoglobin level about 60% of normal, average serum protein concentration about 75% of normal.

Blood Volumes (see Table IV).—Plasma volumes were estimated in 6 males and 10 females, and blood volumes were deduced therefrom, using haematocrit readings. The average figure for total blood volume was 4.30 litres in the males and 3.17 litres in the females. It is felt that the figures for females are the more reliable, as these were, with one exception, estimated by the same technique—namely, the direct measurement of the dye in serum.

TABLE IV.—*Blood Volumes*

Case	Weight (kg.)	Oedema	P.V. (litres)	Hmt. (%)	B.V. (litres)	S.Pr. (g. %)	B.V. in c.cm./kg.
M 2* ..	43	+	2·9	28·6	4·1	—	95
M 9* ..	39	+	2·5	40·2	4·3	—	110
M 23* ..	40	–	3·4	32·1	5·0	5·5	125
M 30* ..	43	+	2·7	35·0	4·1	—	95
M 45 ..	45	+ +	3·2	26·0	4·3	5·3	95 (*a*)
M 50 ..	45	–	2·7	32·6	4·0	—	89
				Av. (6 cases)	4·3		
F 5 ..	(Very wasted)	+ +	2·2	23·0	2·9	5·2	—
F 100 ..	43·5	+ +	2·0	32·0	3·0	5·7	69
F 110 ..	59·3	+ + +	2·5	28·0	3·6	4·5	61
.. ..	47·0	+ +	2·5	36·8	4·0	5·7	84
F 111 ..	31·0	–	2·3	20·2	2·9	4·6	93
F 114 ..	35·1	–	2·2	29·0	3·1	5·6	88 (*b*)
F 116 ..	25·0	+	1·7	37·2	2·7	5·0	112
F 117 ..	36·0	–	2·4	36·0	3·7	5·5	103
F 122 ..	36·0	+ +	2·3	31·4	3·3	4·0	92
F 124 ..	33·2	–	1·9	33·0	2·8	5·0	85
F 125 ..	59·0	+ + +	2·7	26·5	3·7	—	63
				Av. (10 cases)	3·17		

* In these cases the dyed serum samples were not measured directly, as they were in the others, but were first treated to remove other pigments, etc.

(*a*) Blood volume estimated 12 hours after a serum transfusion, which had lowered the haematocrit from 29% (before the transfusion) to 26% (at the time the blood volume was estimated).

(*b*) Blood volume estimated after an infusion of 500 c.cm. inulin–saline solution. The haematocrit before the infusion started was 32% and at the time of estimation of the blood volume 30%.

In 12 of the 15 cases in which body weight was known, the relation of blood volume to body weight varied from 85 to 125 c.cm./kg., averaging 101 c.cm./kg. in 6 males and 95 c.cm./kg. in 6 females. These figures are high compared with the normals of Gibson and Evans (1937)—viz., 77.7 c.cm./kg. for males and 66.1 c.cm./kg. for females. Thus it appears that blood volume in seriously undernourished subjects is not reduced in proportion to body weight. Three other females were found to have far lower ratios of blood volume to body weight—viz., 61, 63, and 69 c.cm./kg. respectively. These three patients all had considerable oedema. However, at least one other patient with a corresponding degree of oedema did not show this relation. All that can be said, therefore, is that, in the presence of oedema, blood volume either bore the usual relation to body weight or was relatively lower. In Case F 110 the blood volume was estimated a second time, after a considerable amount of oedema fluid had been lost; a slightly higher figure was obtained on the second occasion, although the patient had lost 12 kg. in weight. This observation is in agreement with the hypothesis that blood volume in severely oedematous cases is related to the tissue mass and is not increased in proportion to the extra weight of oedema fluid.

Serum Urea.—Serum urea was estimated in over 40 patients, and in some cases serial observations were made. Excluding children and five severely dehydrated adults, the average in 33 cases was 32 mg. per 100 c.cm. In the five adults the figures were 187, 70, 63, 67, and 70 mg. respectively.

Sedimentation Rates.—During May and June, when other haematological observations were being made, it was repeatedly observed that blood samples sedimented very rapidly. The sedimentation rate was recorded in 28 cases between June 7 and July 6 and was increased in every one, the drop varying from 22 to 60 mm. in one hour, with an average fall of 53 mm. In 12 of these patients who were radiologically free from tuberculosis the average sedimentation rate was 49 mm. in one hour, and in 7 of the 12 who had probably not had recent typhus (Weil-Felix reactions: 5 negative in all dilutions, 2 positive in 1 in 80 but not higher) the average was 45 mm. in one hour. The average haematocrit reading of the seven cases was 35.0 and the average serum protein 6.7 g. %. It appears, therefore, that a rapid sedimentation rate is characteristic of starvation cases whether or not infection is present, and that the main cause of this increase in rate is not simply the anaemia of starvation.

Serial Blood Examinations.—Great difficulty was encountered in following up patients, because as soon as they were well enough they were liable to be moved to other camps or to be evacuated from Belsen to their native lands. However, serial observations over periods ranging from 9 days to 45 days were made on 22 patients, and some evidence was obtained that recovery from the anaemia did not depend on the administration of liver or iron. For instance, in three patients who were closely observed, and were known to have had no medicine or injections and to have received simply the ordinary diet, the changes in the blood were as follows:

Case	Date	R.B.C.	Hb (%)	Hmt. (%)
M 2	May 14	2,790,000	57	28·3
	June 9	3,920,000	81	37·0
M 8	May 31	4,010,000	65	32·0
	July 7	4,650,000	76	43·0
M 35 ..	May 30	2,610,000	51	24·0
	June 21	3,640,000	66	36·8

These rates of recovery were greater than those observed in many of the other cases, and some patients showed a very slow rate of improvement, with some tendency of the rate of increase in haemoglobin value to lag behind the increase in red cell count. Very few of the tuberculous patients showed any increase in values, and a few became more anaemic while under observation.

Serial Observations on Serum Proteins.—Between six and ten weeks after the initial liberation of the camp serial observations on serum protein concentration were made in 16 cases over periods extending from 12 to 45 days (average, 28 days). In 11 cases an increase of between 0.8 g. and 3.3 g. % was observed (average, 1.7 g. %). In 5 other cases changes from a fall of 0.2 g. % to a gain of 0.4 g. % were found. In three of these the period of observation was short (12 to 15 days), but in two the period was 37 days. These two patients were non-tuberculous; one had no diarrhoea and the other only very slight diarrhoea. The failure of the serum protein to show an appreciable increase in these two is attributed primarily to a poor intake, since both had indifferent appetites and ate but little. It is of interest that as late as seven weeks after the liberation (that is to say, the first week in June)

none of the 16 cases appeared to have reached their maximum serum protein concentration, since even cases which had by this time reached figures within the normal range showed a further increase subsequently.

Urinary Examinations.—In the majority of starvation cases examined no abnormalities were found in the urine. However, in the remainder two features occurred unduly frequently. First, urinary infections were found in five out of 21 cases taken at random; secondly, evidence of subacute nephritis was present in six out of 14 cases of persistent oedema examined about two months after the liberation of the camp. The most likely cause of this nephritis seems to be typhus.

Renal Function

From the evidence of the estimations of blood urea alone it may be concluded that there is no gross disturbance of renal function in cases of starvation, except in so far as extrarenal azotaemia occurs when there is severe dehydration.

Evidence of a normal glomerular filtration rate in emaciated patients was obtained by estimating the inulin clearance in two female subjects who had lost 36% and 37% of their body weight respectively. The actual inulin clearances observed were within normal limits (see Table V), and when corrected for surface area were slightly higher than the normal average. The renal plasma flow, as estimated by the diodone clearance, was normal in one case but reduced in the other. It is possible that in the latter case apprehension was responsible, since the patient was rather restless throughout the test. In any event, the maximum secretory power of the tubules in this case, as measured by the diodone excretion at a saturation level, was normal. In both these patients blood pressure was low, and it is of interest that renal function was still normal when, as in the first case, the pressure was approximately 88/58.

Inulin and diodone clearances were also measured in two patients with severe generalized oedema. One of these patients was of great interest from several points of view. She had a very swollen face, swollen arms, ascites, oedema of the back, and gross oedema of the legs and feet. Her urine was tested repeatedly and never contained albumin. Her blood pressure was 90/60; there was no dyspnoea or engorgement of the veins. Her serum protein concentration when she was first seen on June 29 was 4.2 g.%. Although there was thus evidence of considerable protein deficiency she had retained quite a large amount of her body fat, as was discovered when "cutting down" to expose a vein. While she was still in this very oedematous condition her renal function was estimated. The inulin clearance was only 66 c.cm./min. and the diodone clearance 182 c.cm./min. Even if these figures are corrected for surface area, using the weight to which the patient was reduced after the loss of most of the oedema fluid, they are still below normal (inulin 80 c.cm./min., diodone 230 c.cm./min.).

The second case of gross oedema with hypoproteinaemia (serum protein 4.0 g.%) but without albuminuria gave similar results. This patient died shortly afterwards, and it was thus possible to examine kidney sections. The only histological change was a slight desquamation of tubular epithelium. It thus appears that in at least some cases of "hunger oedema" which clear up slowly there is an impairment of renal function, although the cause of this is not known.

Inulin and diodone clearances were carried out in two patients who had been diagnosed as cases of nephritis. Very low clearances were found in both instances.

[In estimating inulin and diodone clearances the routine followed did not differ in any essential from that described by Smith (1943) and co-workers (Goldring *et al.*, 1940). Inulin was estimated by an unpublished method of Dr. S. W. Cole, and diodone by Alpert's (1941) method.]

TABLE V.—*Renal Function Tests (Inulin/Diodone Clearances) in a Miscellaneous Group of Starvation Cases*

Patient	Age	Weight (kg.)	Previous Weight (kg.)	Height (cm.)	Surface Area (sq. m.)	B.P. during Clearances	Plasma Clearances (c.cm./min.)				T_MD mg./min.	
							Inulin		Diodone			
							Obs.	Corr.	Obs.	Corr.	Obs.	Corr
(A) Simple Cases of Emaciation without Oedema and without Albuminuria												
Normal female*	—	—	—	—	1·73	—	—	117	—	594	—	42·6
F 124	25	33·2	48·0	153	1·22	102/70–108/76	88	124	241	340	32·0	45·3
F 114	21	35·1	56·0	150	1·24	88/52–88/60	102	141	501	710	—	—
(B) Cases of Generalized Oedema without Albuminuria												
F 110	50	59·3	80·0	160	1·62	90/60–92/60	66	70	182	194	—	—
"	—	42·0†	—	—	1·40	—	—	80	—	230	—	—
F 122	50	43·9	80·0	155	1·39	90/60	43	53	228	283	17·7	22·0
(C) Cases of Nephritis												
F 102	21	—	—	—	—	132/84	58	—	211	—	—	—
F 116	23	25·0	50·0	159	1·11	74/54	41	64	135	210	15·8	24·7

* From Smith (1943). † Weight after loss of most of oedema fluid.

(N.B.—Figures are based on the average of three clearance periods in those cases in which only the inulin clearance (C_{IN}) and the diodone clearance (C_D) were measured. When the maximal secretory power of the tubules for diodone (T_MD) was also measured, C_D is based on two periods, T_MD on two periods, and C_{IN} on four.)

Summary

Observations were made on Central European subjects, of both sexes, who had survived conditions of very severe starvation. The average loss of body weight in a group which included some of the less severely affected cases was 39%, and in individual cases the loss was as great as, or slightly greater than, 50% of the original weight. The majority of the patients had recently had typhus, and in one group examined 40% had pulmonary tuberculosis.

All subjects examined were anaemic, the average Hb value in 30 males being 62.5% (9.8 g.%), and in 23 females 57.3% (8.9 g.%); children were similarly affected. In all cases the type of anaemia was the same—namely, normocytic and normochromic—indicating a reduction in the total output of erythrocytes from the marrow rather than any interference with maturation. There was little difference in haemoglobin values between tuberculous and non-tuberculous subjects, indicating that tuberculosis was not the chief cause of this anaemia. In uncomplicated cases, recovery from anaemia proceeded satisfactorily with ordinary feeding and without the addition of liver or iron to the diet.

Total serum proteins were reduced to an average figure of 5.1 g. per 100 c.cm. (normal British soldiers, 6.7 g. per 100 c.cm.). There was a correlation between the degree of oedema and the total serum protein levels when averages were compared, although in individual cases there was some overlap. The serum protein levels in individual cases were not correlated with Hb levels. The return of serum protein concentrations to normal was slow, and on the average was still incomplete two months after the camp was liberated.

Blood volume was reduced, but to a less extent proportionately than body weight. In oedematous subjects the blood volume tended to be lower relative to the total body weight.

There was no evidence of any interference with renal function in severely starved non-oedematous patients, apart from cases complicated by dehydration. However, two subjects with gross oedema (severe hypoproteinaemia; no albuminuria) showed considerably reduced clearances of inulin and diodone.

Starving patients are fastidious about their food, and it does not suffice to provide a diet which merely satisfies theoretical nutritional requirements.

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D.B.E.: A NEW SYNTHETIC OESTROGEN

BY

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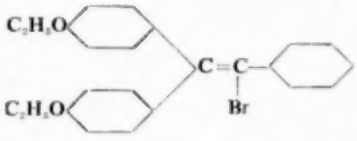
Robson and Schönberg reported in 1942 the synthesis of the pro-oestrogen αα-di-(*p*-ethoxyphenyl)-β-phenyl bromoethylene, the formula of which is



This substance, known as D.B.E., is absorbed from the alimentary tract, but differs from other orally active oestrogens in having a prolonged action whether it is given by mouth or by injection. By experiments with oöphorectomized mice Robson and Schönberg showed that D.B.E. has an oral threshold similar to that of oestradiol and much higher than that of stilboestrol. Its action differs from those of oestradiol and stilboestrol in that a small increase in the dose produces a great prolongation of action. It appears, therefore, that D.B.E. is stored in the body and slowly released. The main site of storage was shown to be the fat (Robson and Ansari, 1943), substantial amounts being present in the body fat of mice a fortnight after administration, by which time it has been eliminated from other tissues.

At first sight it seemed doubtful whether such a substance would be of more than academic interest. Further consideration suggested the possibility that in certain menopausal patients who are liable to hypochondriasis some psychological advantage might be obtained by the administration of a drug at, say, weekly intervals rather than several times a day or even daily. It was therefore decided to investigate the effects in women complaining of severe menopausal symptoms. Such patients are especially suitable for trials of oestrogenic substances, for the effects may be numerically, if roughly, gauged by the number of "flushes" and more exactly by the examination of vaginal smears. During the trial three cases of carcinoma of the prostate became available, and it was hoped that in these the level of serum acid phosphatase might act as a numerical expression of oestrogenic effect. Unfortunately the shortage of staff in pathological laboratories at present made it impossible to carry out this plan completely. The effects were examined also in three cases of uterine atrophy.

Menopausal Patients

Six patients were chosen in whom the only menopausal symptoms were hot flushes. They were all women whose general demeanour and past history suggested that they were mentally stable. It is of interest in this connexion that one patient, not included in the series, was entirely unrelieved by D.B.E. and by stilboestrol, but was completely cured by phenobarbitone.

Each patient was given an inert tablet for a month before the trial and the daily flushes were counted. The daily average was in no case significantly affected by "dummy" treatment.

Case 1.—Average in the control period, 20 flushes a day. Preliminary experiments with doses of from 0.1 g. and upwards showed that clear-cut results were not obtained with a single dose of less than 1 g. A dose of 1 g. was followed four days later by a steady fall in the number of flushes, the improvement reaching a maximum in a fortnight. A maintenance dose of 300 mg. weekly kept the flushes at the intended level of about 4 a day. Of late, on the same dose, they have averaged 2 a day.

Case 2.—Average in the control period, 22 flushes a day. Preliminary experiments with doses of from 0.5 g. and upwards showed that satisfactory results were not obtained with a single dose of less than 1 g. This dose was followed by an immediate fall to an average of 3 flushes a day, which was maintained for 3 weeks. A maintenance dose of 300 mg. weekly maintained the flushes at an average of 5 or 6 a day, though an occasional additional loading dose has been needed.

Case 3.—Average before treatment, 18 flushes a day. The effect of a single dose of 1 g. was studied. The improvement was not evident until the beginning of the second week, but continued steadily for 6 weeks, when a sudden deterioration occurred. Daily vaginal smears showed an improvement, beginning on the sixth day. They became normal on the eighth day, and despite continued flushes remained substantially normal until the clinical deterioration set in, this deterioration being "mirrored" by the histological appearances. The deterioration was stopped by 500 mg., and a maintenance dose of 300 mg. has been needed.

Case 4.—This patient had originally been treated successfully with another oestrogen and had relapsed after cessation of treatment. She was having about 4 flushes a day. One gramme of D.B.E. was given. An improvement began in a few days, and, with a maintenance dose of 200 mg. weekly, flushes entirely disappeared in 10 days. When the maintenance dose was reduced to 100 mg. the flushes gradually reappeared in the succeeding fortnight.

Case 5.—Before treatment this patient had only 2 or 3 flushes by day but was greatly disturbed at night, when the flushes at the best occurred 4 times and at the worst were almost continuous. She was given 1 g. of D.B.E. with no maintenance dose. Improvement began in 3 days, and in the second week the flushes averaged 2 in the 24 hours. This state was maintained for a further fortnight, when a gradual deterioration set in. The loading dose was repeated, and she has remained well on a maintenance dose of 200 mg. weekly.

Case 6.—Before treatment she had 12 flushes a day. A dose of 1 g. of D.B.E. gradually reduced her flushes. After 3 weeks they averaged 1 or 2 a day. On a maintenance dose of 200 mg. weekly they ceased altogether, but when this was reduced to 100 mg. they reverted in a month to 6 or 7 a day.

Cases of Carcinoma of the Prostate

Case 7.—Aged 76. Admitted to hospital under Mr. R. H. Gardiner complaining of symptoms of prostatic enlargement for only one month. The prostate seemed to be benign. The vasa were tied and a suprapubic cystotomy performed on Oct. 5, 1943. He was discharged and readmitted for the second operation. Cystotomy on Jan. 21, 1944, disclosed that the prostate was malignant and inoperable. He was transferred to a medical ward, where further investigation failed to reveal the presence of metastases. The serum acid phosphatase was 3.0 units per 100 c.cm. He was given 1 g. of D.B.E. The S.A.P. was re-estimated by Dr. Douglas Robertson at frequent intervals until April, 1944, when shortage of staff made a continuation impossible During this time he received no additional D.B.E., as it was hoped that the biochemical estimations would indicate the necessary frequency of administration. He began to micturate per urethram; the suprapubic opening closed, and he was discharged in good order on March 8, 1944. When it became impossible to continue the frequent S.A.P. estimations he was given 1 g. of D.B.E. and a weekly maintenance dose of 200 mg. He remained well until Jan., 1945, when he began to have dysuria and frequency of micturition with occasional incontinence. These symptoms increased in severity and he was readmitted on Feb. 20. There was no change in his clinical condition, and skiagrams still failed to show any metastases. His S.A.P. had, however, risen to 14.4 units. His urine was grossly infected with *B. coli*. When this had been treated he became symptom-free and insisted on going home. Meanwhile he was given 3 g. of D.B.E. with a maintenance dose of 0.5 g. weekly. The S.A.P. dropped only to 12.0 units and thereafter rose again. The maintenance dose was then increased to 1 g. weekly, but with little effect. On June 8 a change was made to 5 mg. of stilboestrol three times a day. On July 2 the S.A.P. was 4.3 units per 100 c.cm.

Case 8.—Aged 70. This patient was admitted on June 16, 1942, with the symptoms of enlarged prostate. Carcinoma was suspected, for he had severe pain in the lower part of the back and in the thighs. The skiagrams showed osteo-arthritis only, and the S.A.P. was 0.9 unit. The prostate was enucleated by Mr. Gardiner, and was found by Dr. R. W. Scarff to show an area of spheroidal-celled carcinoma. He was given 1 g. of D.B.E. with a maintenance dose of 200 mg. weekly, and has remained free from prostatic symptoms since. Skiagrams show no secondaries, and the S.A.P. has remained normal.

Case 9.—Aged 51. The patient was under treatment for post-operative pneumonia following appendicectomy. There had been no symptoms of prostatic enlargement before his admission, but while in bed in hospital he began to have slight difficulty in beginning micturition and to complain of backache, which rapidly became very severe. The prostate did not seem to be enlarged, but it was hard. Skiagrams showed extensive secondaries in the pelvis, sacrum, lower lumbar vertebrae, and ribs. The S.A.P. was 46.2 units. Treatment was begun with 1 g. of D.B.E. Relief from pain was satisfactory for a day or two after each dose, but gradually increasing doses up to 5 g. weekly failed to prevent a steady rise in the S.A.P. After seven weeks it had risen to 105 units. D.B.E. was stopped and 5 mg. of stilboestrol t.d.s. given instead. The S.A.P. fell to 8.9 units in three weeks.

Patients with Uterine Atrophy

Case 10.—Her periods began at 14 and occurred regularly for 3 days at intervals of 30 days until the birth of a child at the age of 23. After 10 months of lactation, menstruation was again normal for three years. It then ceased, and had not occurred for 17 months before her first attendance. The uterus was found to be very small. Treatment with D.B.E. was begun, but soon afterwards she received serious injuries in an air raid and was lost to view. In Oct., 1944, treatment was begun again with 1 g. of D.B.E. and a weekly maintenance dose of 200 mg. Treatment for 5 months produced neither menstruation nor increase in size of the uterus.

Case 11.—Since the menarche began at 14 the periods had occurred at irregular intervals of 2 to 6 months. The uterus was minute and the physical make-up suggested hypogonadism. A loading dose of 1 g. of D.B.E. with a maintenance dose of 200 mg. weekly produced no change in three months. During the succeeding three months she was given 5 mg. of oestradiol benzoate intramuscularly twice weekly. The uterus increased in size and menstruation occurred more frequently. A change to oestradiol benzoate, 5 mg. twice weekly during the first fortnight only of the intermenstruum, produced regular menstruation, which has been maintained less regularly since cessation of treatment.

Case 12.—This patient complained of dysmenorrhoea. The menarche had begun at 11 and menstruation had occurred for 5 days every 21 to 56 days. It was very scanty. The uterus was minute. During a period of a year a total of 12 g. of D.B.E. was given. Her menstruation became distinctly more regular (3–4/28–33), but the dysmenorrhoea was not relieved and the size of the uterus was only doubtfully increased.

Toxic Effects

D.B.E. is of very low toxicity. Two menopausal patients treated with the substance felt sleepy on the day after each administration. The symptom was not regarded as serious by the patients, and was mentioned only in answer to a leading question. Lassitude occurs occasionally during the administration of other oestrogens. Only one patient complained of nausea. This symptom occurred on the same day as the administration of the loading dose, and was not severe. The patient who received 5 g. a week had no unpleasant symptoms. Uterine bleeding, leucorrhoea, and headache were not reported.

Discussion

It is clear from the results obtained in six patients suffering from the vasomotor symptoms of the climacteric that D.B.E. given orally is an effective oestrogen with a prolonged action. A loading dose of 1 or 2 g. brought relief of symptoms for two or three weeks. The good effects can be maintained by a weekly dose of 100 to 300 mg.

Less satisfactory results were obtained in three cases of uterine atrophy; but little can be learned from this, for the response of this condition to other oestrogens is very uncertain. D.B.E. failed in carcinoma of the prostate. One of the three patients has remained well for three years, but his prostate was removed at so early a stage of the disease that it is possible to ascribe his good health to the operation rather than to the medical treatment. The other two patients showed no significant improvement under treatment with D.B.E., but responded dramatically to stilboestrol.

This failure may be due to insufficient dosage. It is possible to judge this question by two criteria—comparison with stilboestrol or comparison between the two classes of patient. It is difficult to compare the effective dose of two oestrogens which are absorbed and destroyed or excreted at different rates. Judging from mouse experiments (Robson, personal communication) it would seem that from 20 to 50 times as much D.B.E. is required to produce the same effect as stilboestrol, but allowance must be made for species differences. Taking this figure with reservations, it would appear that at the time of maximum dosage one patient with carcinoma of the prostate was having the equivalent of 80 to 200 mg. of stilboestrol a week and the other 200 to 500 mg. Both responded dramatically to about 100 mg. of stilboestrol weekly. Moreover, one was given about four times and one about ten times the amount required to relieve menopausal symptoms and to change the vaginal smear. It must be remembered that some menopausal women are relieved by extremely small doses of oestrogens, but, taking the two criteria together, it seems unlikely that the dose was too low in the carcinoma cases. The possibility should be borne in mind that there may be a sex difference in the rates of absorption of oestrogens, so that a dose sufficient to treat a woman may be insufficient for a man. No data on this question seem to exist. It should also be remembered that D.B.E. is not strictly an oestrogen but a pro-oestrogen, and that pro-oestrogens may be less effective than oestrogens in the control of carcinoma. The oestrogenic effect of a pro-oestrogen depends not only on the dose but on the rate of its conversion into an oestrogen. An increase in the dose beyond the amount which can be converted by the body would not produce any increase in the oestrogenic effect. It may well be that the body is capable of converting from pro-oestrogen to oestrogen a sufficient amount to deal with menopausal symptoms, but not enough to control carcinoma of the prostate, which probably demands a higher oestrogenic level. Robson (personal communication) has found that the administration of large doses of D.B.E. to oöphorectomized mice does not induce mating, whereas large doses of oestrogens (for example, oestradiol and triphenyl-chloroethylene) do so. Since the oestrogenic level necessary to induce mating is about 200 times that necessary to produce vaginal cornification, it seems probable that in this experiment the D.B.E. was not converted into an oestrogen at a sufficient rate to produce the concentration necessary for mating. A similar failure may be the explanation of the ineffectiveness of D.B.E. in controlling carcinoma of the prostate.

D.B.E. is a substance of great theoretical interest, but in some respects it is inferior to the other synthetic oestrogens, and it is doubtful whether the advantage of weekly over thrice-daily administration is sufficient to warrant the general introduction of yet another.

I would like to express my gratitude to Prof. McIntosh, Dr. Douglas Robertson, Dr. John Murray, and Mr. R. H. Gardiner for their collaboration, and to Dr. A. N. Macbeth, of Organon Laboratories, for supplies of D.B.E.

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D.B.E. IN TREATMENT OF MENOPAUSAL SYMPTOMS

BY

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The chemical and pharmacological properties of this new synthetic oestrogen are summarized in the accompanying paper by Dr. Raymond Greene. The aims of the work described in that paper were: (1) to confirm that the prolonged action of D.B.E. occurs in the human subject; and (2) to establish a dosage suitable for clinical use.

My own aspect of the work has been confined to patients suffering from symptoms due to the premature cessation of ovarian function brought about by surgical and radiological means. Some degree of selection was used in choosing the subjects. This was done as follows. Twenty-five case records were selected at random—7 of these were discarded as they were not experiencing menopausal symptoms at the time; 4 were rejected because they lived more than 20 miles from Newcastle and it was felt that they might not attend regularly on this account.

Fourteen attended, and were offered treatment for their "hot flushes." No previous therapy with oestrogens had been given to any of them. For the first four weeks these patients were treated with inert tablets consisting either of 15 gr. (1 g.) of cane sugar or of 10 gr. (0.65 g.) of household flour coated with chocolate. On a chart provided for the purpose they kept a record of the number of flushes experienced. Three of the patients were relieved by these tablets and were dropped from the series.

The remaining 11 had no relief, and the weekly total of flushes remained constant. 10 patients were given an initial dose of 1 g. D.B.E. and one severe case received an initial dose of 2 g. 8 of the 11 had some reduction in the number of flushes one week after the administration, but only in two mild cases was the response pronounced. One of these, which

had been averaging 20 flushes a week, dropped to *nil* in two weeks, and this improvement was maintained for another two weeks without further treatment. Thereafter the flushes began to return. A dose of 2 g. brought about a marked improvement in 9 patients, and this effect lasted on an average three weeks without further administration. After this time the number of flushes increased again.

The next problem was that of a maintenance dose. This varied according to the severity of the symptoms, and it was eventually found that 0.2 g. per week was satisfactory. In this series it was administered in doses of 0.4 g. fortnightly. It was also found that if more than three weeks was allowed to elapse between the administrations it was advisable to give another initial dose. Increase of the maintenance dose was not satisfactory. Some of the side-effects of other synthetic oestrogens were observed. Four patients vomited after receiving 2 g. This started about 8 hours after taking the tablets, and continued for 36 hours. One of these patients had nausea but no vomiting after a small dose. Three others did not actually vomit but were nauseated by large doses. This began about 24 hours after taking the tablets and continued for some three days. Three patients had uterine bleeding or a brown discharge lasting for several days. In two this occurred two weeks after the last administration, and in one immediately after taking a large dose. Two other patients had severe uterine colic following a dose of 2 g., and one of these developed a white vaginal discharge which was found to be due to the excessive secretion of mucus from the cervical glands. Five patients experienced headache for 24 hours after a large dose: they had not previously suffered from headache. In those cases in which headache was a prominent feature of the menopausal syndrome it was relieved by D.B.E. Four patients complained of lassitude during the course of the treatment. Although this symptom does not appear to be generally recognized as an effect of synthetic oestrogens I have found that it frequently occurs in patients receiving stilboestrol. Most of these effects occurred only when large doses were given.

Results

Of the 11 cases 5 were completely relieved of their symptoms; 3 were greatly improved, and the average reduction in the weekly number of flushes in these patients was from 80 to 6. The remaining 3 patients failed to respond at all even after doses of 3 g.

The 3 who were improved but not completely relieved were put on to stilboestrol 1 mg. t.d.s. This brought about complete relief in all cases. Two of the three failures were similarly treated and were also completely relieved within three weeks of starting stilboestrol therapy. The third patient in this group suffered from disseminated sclerosis and failed to attend again. One of the patients had a severe leucoplakic vulvitis which did not improve on the doses given and has subsequently undergone vulvectomy.

Summary

D.B.E. ($\alpha\alpha$-di-(*p*-ethoxyphenyl)-β-phenyl bromoethylene) is a synthetic oestrogen with a prolonged action.

This substance was used to relieve menopausal symptoms in 11 patients who had undergone surgical or radiological castration: 5 were completely relieved, 3 greatly relieved, and 3 showed no response.

The dosage required for the relief of these symptoms is an initial dose of 2 g. followed by a maintenance dose of 0.2 g. weekly. Mild cases may require only half this dosage.

The side-effects of other synthetic oestrogens have been noticed with D.B.E.

It appears from this small series that D.B.E. is probably not as effective as stilboestrol in the relief of menopausal symptoms.

It is probable that its sole advantage is that it needs to be administered infrequently and not daily as with other synthetic oestrogens.

I should like to thank Dr. A. N. Macbeth for her help and advice, and Organon Laboratories Ltd. for the supplies of D.B.E. used in this investigation.

A. H. Williams (*Delaware State med. J.*, 1945, **17**, 179) records a case of myelitis following chicken-pox in a boy aged 4. Recovery took place without specific therapy.

CONCENTRATING MALARIA PARASITES IN THIN FILMS

BY

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The diagnosis of malarial infection has often to be made on samples provided by practitioners, and the pathologist frequently finds fault with the smears provided—usually because they are too thick, are unevenly spread, and are allowed to dry too slowly.

The thick-film technique is widely employed to give concentrated films, but the parasites are not intracellular and many pathologists do not like them. Wilcox (1942), in her monograph, describes the thick-smear technique very clearly, but obviously it is one that only the trained laboratory worker can employ; she states that the thin film is ideal for demonstrating the morphology of the individual parasites. Figures are given for the degree of concentration obtained by many authors, using the thick-smear method; these vary from 10 to 50 times. Todd and Sandford (1943) quote the method of Bass and Johns; as described it is very laborious, but it does provide concentrated intracellular parasites.

There will be many cases of malarial relapse in the next few years, and it is hoped that the following technique may be a help in proving if such cases are suffering from a genuine relapse; the proof may be of great importance in the gaining of a pension for the patient. The technique was evolved to secure the advantage of concentration as well as that of seeing intracellular parasites; it allows a practitioner to obtain the blood samples, using the technique he employs for obtaining blood for a Wassermann reaction, and saves making blood smears.

Technique

Any blood may be used, but, if the blood has clotted, many of the white cells and all the platelets are avoided, making the slide easier to examine. When clotted blood is employed it is shaken and the serum drawn off and centrifuged for 2 to 3 minutes in a small tube; the serum is discarded, except for a volume approximately equal to that of packed red cells. The residual serum and the red cells are mixed, and this blood is run into a capillary tube; the end of the capillary is sealed and the tube centrifuged hard (2,000 to 3,000 revolutions per minute) for 20 to 30 minutes.

The capillary is removed and a scratch made, with a glass-cutter or diamond, about 1/8 in (0.32 cm.) above the top of the packed red cells; the tube is held horizontally, and is broken at this mark. A second cut is made about 1/8 in. below the top of the red-cell layer; the tube is again held horizontally, and is now broken at this second mark. The tube is held horizontally after the first cut to prevent the plasma running down over the operator's fingers, and, after the second, to prevent any loss of the contents of the wanted specimen.

The next stage was evolved to allow easy handling and mixing of the contents of this small segment of the capillary tube. The butt end of a Pasteur pipette, where it starts to narrow down, is heated in a peak flame, and when soft the two extremities of the pipette are pressed towards each other, allowing the tube to bend into an S shape. The pipette is again heated in the peak flame, about 1 in. (2.5 cm.) from this bend; it is drawn out and sealed taking care to make the terminal portion thin. If the end is not thin it is difficult to break off the tip later, and some of the specimen will be lost. The short piece of capillary tube is dropped into this prepared pipette with serum uppermost; the tube is then placed in the centrifuge, which is switched on for from 2 to 5 seconds. The blood is now in the capillary end of the pipette; the thinned tip of the pipette is cut off, a teat is applied to the butt, and the blood is blown out on to a slide and a thin smear made. Alternatively, the blood is mixed on a wax slide. The edges of the film are examined for the parasites. The accompanying figure shows the completed pipette.

Results

The degree of concentration has been estimated by counting the number of parasites seen, under the 1/12 objective, in an equal number of fields, usually 100, in both the plain and the concentrated films. In the last 22 positive bloods the average degree of concentration has been ×15.8—made up of 426 parasites in the plain, as against 6,718 in the concentrated films. The concentration has varied from ×5 to ×56. Eleven of these lay between ×10 and ×24; others were ×5, ×6 (twice), and ×9. There were also specimens with ×56, ×50, ×35, and ×33 concentration. In a total of 52 positive bloods examined 5 were positive in the concentrated films only. These figures would seem to compare favourably with those obtained in the thick-smear method. Schüffner granules do not appear to stain well in the concentrated preparations made by me.

Since the technique was evolved only two cases of falciparum infection have been concentrated. The first was diagnosed as an M.T. infection on a thin smear provided on July 20, 1945; the hospital was informed by telephone and warned to apply intensive therapy, as a heavy infection with trophozoites was present. The patient had the following treatment:

July 20: 9 g. intramuscular quinine.

July 21: Mepacrine t.d.s.

July 22: Morning—mepacrine, 2 doses. Patient went into coma at midday. Afternoon—9 g. *intravenous* quinine.

July 23, 24, and 25: Mepacrine t.d.s.

On July 25 venous blood and thin smears were obtained and were sent by post to the laboratory; 7 gametocytes in 500 fields were seen in concentrated smears made on July 26; but several pathologists have failed to find parasites in the thin smears provided.

The other M.T. infection was a fatal case of gastro-intestinal and cerebral malaria (which it is hoped may be described in detail later). 1½-day-old blood, taken for a Widal test 18 hours before death, was used to provide the red cells; unconcentrated smears showed a very heavy infection with trophozoites (1 in every 3 of the red cells were infected). With such a heavy infection it is hard to demonstrate concentration, but the concentrated smears showed parasites in 2 out of every 3 red cells, and also demonstrated gametocytes and schizonts which were not seen in the plain smears.

Evidence of concentration of crescents based on two cases is not sufficient, and I would be grateful for both thin smears and venous blood samples from proved cases of M.T. infection, as I would like to use the method on more such cases.

Other Possible Uses for the Method

The method described has been used several times to concentrate the nucleated cells in marrow obtained by sternal puncture, to facilitate the search for Leishman-Donovan bodies. The marrow was placed in a tube containing dried heparin (the mononuclears tend to pick up the crystals of Wintrobe's oxalate mixture, so this could not be employed). Very good concentration of the nucleated cells was obtained, but no L.D. bodies were seen; in whole blood heparin often causes agglutination of the white cells; but, even after two hours and the centrifuging in capillaries, there was no tendency for the cells to clump in these sternal-marrow specimens. It may be that the technique could be used for the diagnosis, on stained smears, of other protozoal and spirochaetal infections, but I have not had the opportunity of trying it.

I would like to express my thanks to Sir Philip Manson-Bahr for his encouragement and advice, to Dr. C. M. Wenyon for his helpful criticisms, and to the Regional Adviser in Pathology, Prof. Bernard Shaw.

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J. K. Mohanty (*Ind. med. Gaz.*, 1945, **80**, 187) treated 62 cases of whooping-cough by injection of maternal whole blood. It was efficacious in about 61% and was followed by some improvement in another 9.7%.

Medical Memoranda

Immunity to Sandfly Fever

In a previous article (Cullinan and Whittaker, *Journal*, 1943, 2, 543) an outbreak of sandfly fever in two adjoining hospitals in the Middle East, occurring in the summer of 1942, was described. In that outbreak most of the N.C.O.s and men of the staffs of the two hospitals and, later, large numbers of patients admitted for other diseases to Hospital A were attacked (Hospital B was not at first functioning). In the summer of 1943 sandfly fever was rampant in the surrounding district, and close on 1,000 patients suffering from the disease were admitted to Hospital A from outside (Hospital B had now left). Inside the hospital, however, far fewer members of the staff and patients admitted for other diseases were affected. This lower morbidity within the unit may have been related to improvements in the camp site. Measures for "control" were the same in both years.

In 1942 both hospitals were newcomers to the district. Although Hospital A had been in the Middle East for a considerable time, it had come from an area where sandfly fever was unknown. Hospital B had recently arrived from the United Kingdom. In the 1942 outbreak it was recorded that 15% of the N.C.O.s and men had two and sometimes three attacks of sandfly fever at intervals ranging from 2 to 12 weeks during the period of the epidemic. Moreover, it was obvious that these later attacks were not relapses but were caused by reinfection. This suggested that one attack of sandfly fever conferred little or no early immunity, or that, if it did, it was remarkably short-lived.

In the 1943 outbreak, however, there was evidence that an attack of sandfly fever might confer a more distant immunity. During the time of this outbreak the average daily strength of N.C.O.s and men in Hospital A was 240. Between June 1 and Sept. 30, while 55 of the 142 who had not been with the unit in the previous summer caught sandfly fever, only 13 of the 98 who had been with the unit during both summers were affected. In other words, the disease was roughly three times less common among those who had been present in the 1942 epidemic than among those who had not.

The evidence suggests that while an attack of sandfly fever does not confer an early immunity, or that if it does it is short-lived, it may confer a more distant immunity.

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Late Consulting Physician, East Africa Command; Assistant Physician, St. Bartholomew's Hospital

Frontal Lobe Abscess Treated with Penicillin

Spreading acute osteomyelitis of the frontal bone is a well-recognized complication of frontal sinus suppuration and carries a high mortality. When complicated by a frontal lobe abscess the prognosis is wellnigh hopeless. The following case illustrates, I think, not only the efficacy of penicillin in this condition but also the necessity for adequate surgery if treatment is to be successful.

CASE RECORD

A boy aged 16 was admitted to hospital on May 14, 1945, with a history of frontal and occipital headache, vomiting, and restlessness of a week's duration. There was no history of trauma. Temperature 101.6°, pulse 90 a minute. There was a red fluctuant swelling overlying both frontal sinuses, but no nasal discharge. A diagnosis of frontal sinus empyema was made, and this was confirmed by skiagrams. On the 16th both sinuses were drained externally and thick offensive pus evacuated. It contained *Staph. aureus* and diphtheroids which were 100% penicillin-sensitive. On May 31, in spite of good drainage and sulphathiazole in full doses, the boy became drowsy and irritable, and a spreading diffuse oedema of the frontal region extending backwards was now evident. On June 1 he became semiconscious and his temperature fell to 96° F. and pulse to 48. The right pupil became widely dilated and fixed, while the left pupil remained contracted. On June 2, under local analgesia, supplemented by chloroform on an open mask, a large semicircular flap was turned down over the frontal region. There was widespread necrosis of bone with some loose sequestra. All necrosed bone was removed, and a sinus was found in the anterior aspect of the right frontal lobe through which pus flowed out under tension. This sinus was utilized later for the insertion of a small rubber drainage-tube which was sutured to the dura. Several ounces of pus were aspirated from the abscess cavity. On June 4 penicillin therapy was begun, 2 c.cm. (123,500 units) being injected intramuscularly every 3 hours for a period of 10 days and 6 c.cm. instilled into the abscess cavity twice daily for 5 days. Rapid improvement was soon manifest, and the drain was removed after 3 weeks. The frontal sinuses, however, continued to drain, and on July 9 they were again exposed by an upturned flap and multiple polypi

removed from both sides. On July 30 all the wounds were dry and he was allowed up. No obvious change for the worse had occurred in his mental condition. Skiagrams of the skull revealed a gap in the frontal bone measuring 3 in. by 2 in. (7.5×5 cm). It is proposed to close this gap by a bone-graft at a later date.

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A Case of Locked Twins

This note on a case of locked twins is offered in the belief that all such cases should be reported to assist future compilations.

CASE HISTORY

Mrs. A., aged 23, a para-1 gravida-2, was admitted to Dilston Hall Maternity Hospital at 6 a.m. on April 17, 1944. The patient was at full term by dates and had been in labour for about two hours. On admission the fact of labour was confirmed, and her case was diagnosed as a singleton breech presentation with membranes ruptured. At 8.30 a.m. the day-staff labour ward sister first saw her, and on separating the labia she noted: (*a*) two small feet presenting which from their size she diagnosed as belonging to a twin, and (*b*) a short loop of prolapsed cord which was thin and almost pulseless. She called me, and I was available in a matter of minutes.

I found the patient in the lithotomy position ready for delivery with both feet protruding from the vulva and a 5-in. (12.5-cm.) loop of cord with them. The feet showed signs of life. The cord was not palpated. The cervix was fully dilated and withdrawn. The feet, knees, and breech were extracted and delivery was made as far as the umbilicus. Progress then ceased. Chloroform induction was begun, but before anaesthesia was established I was able to reach up on the maternal left side of the pelvis and feel a vertex about 1 in. (2.5 cm.) above the level of the ischial spine of that side. While the uterus was relaxed it was easy to push back this vertex, using two fingers only, and to secure the posterior arm of the leading twin. The anterior arm was then freed. The first twin was then easily delivered by extension-traction, using the left hand, while two fingers of the right hand were employed in holding back the second vertex above the brim of the pelvis.

The first twin was "shocked," but responded to treatment quickly. The second twin was born spontaneously by the vertex ten minutes later. It was in very good condition. The prolapsed cord belonged to the first twin.

The twins were both males and appeared to be uniovular, weighing 4 lb. 10 oz. (2.1 kg.) and 5 lb. 3 oz. (2.35 kg.) respectively. They made normal progress, being discharged on the 22nd day weighing 5 lb. 4 oz. (2.38 kg.) and 5 lb. 6 oz. (2.44 kg.) respectively. The maternal recovery was satisfactory and afebrile.

Interesting points in the above case are: the presentations were breech-vertex; the twins were uniovular; both bags of membranes had ruptured spontaneously; early diagnosis was facilitated by the need for medical aid for prolapse of the cord; obstructed labour did not arise; in the easy conditions it was possible to make the required manipulations before anaesthesia was established; and both twins were secured alive.

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Penicillin in Chronic Ear Disease

The persistence of treatment-resistant cases of chronic ear disease in personnel of H.M. ships not only causes despondency in the medical department but debars these men from certain duties, such as those necessitating wearing ear-phones, etc., where they are liable to pass on their infection to the next "watch." Therefore it was decided to treat a number of cases in our ship with local penicillin in the hope of getting better results. Conditions were ideal in that the ship was operating in a temperate climate with normal humidity.

Cases with histories of chronic ear disease, each of which had been under treatment for exacerbations of their chronic condition in the ship but were then in a more or less quiescent state, were selected. A careful history of each case was taken, though records of previous examinations and treatment were lacking in several instances. Bacteriological cultures were grown and white cell counts were done before and after the experiment. Those men, whose ears produced growths of organisms which are not sensitive to penicillin, were treated in like manner, as it was considered that they would be useful controls.

TECHNIQUE

Using every possible aseptic precaution, including the wearing of sterile gown and mask, a solution of penicillin was prepared by dissolving 100,000 units of penicillin in 64 c.cm. of sterile distilled water; this was divided equally into four sterile bottles for use on four successive days.

The aural meatuses were carefully mopped out with pledgets, followed by the instillation of 1 c.cm. of solution (approximately 1,560 units of penicillin). The patient's head was kept tilted for at least five minutes, after which the solution was encouraged to remain in the meatus by the introduction of small sterile gauze wicks. This routine was repeated every twelve hours for four days. Each case thus received 12,500 units of penicillin. In cases with tympanic perforations the solution went in easily enough and did not tend to run out, but in cases with intact drums and narrow meatuses 1 c.cm. of the solution could be instilled therein only with care and patience. These cases were followed up for two months after treatment.

SUMMARY OF RESULTS

(1) All cases caused by penicillin-sensitive organisms (e.g., *Staph. albus*) were cured. (2) Where mixed infections existed the condition was improved only—leaving the penicillin-resistant bacteria unchanged. (3) Where only penicillin-resistant organisms (e.g., *B. proteus, Ps. pyocyanea,* and *M. catarrhalis,* etc.) were demonstrated the condition remained unaltered. (4) Comparatively small doses of penicillin eliminated penicillin-sensitive organisms. (5) The local application of penicillin solution only was tried: insufflation of powdered penicillin might offer an improved technique. (6) The raised white blood cell count returned to normal within two to three weeks in those cases which were cured. (7) It was demonstrated that before treating suppurative otitis the causative organism must be identified, and only those cases which are caused by penicillin-sensitive organisms are worthy of penicillin therapy.

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Ether Convulsions with Hyperpyrexia

The following case of ether convulsions is of interest in that the high temperature recorded tends to support the heat-stroke theory of causation. One feels that the conditions under which this operation was performed were such as to produce a rapid rise in the patient's temperature, and as he was already pyrexial at the time of the operation a state of hyperpyrexia was attained, which, with the neurogenic stimuli postulated by Brennan (1941), may have been the precipitating factor in the convulsive attack.

CASE RECORD

The patient, a healthy young soldier, was admitted to this hospital on a sultry evening in Aug., 1943, with acute obstructive appendicitis and symptoms of peritonitis. His temperature on admission was 100° F. The operation was carried out, under black-out conditions, in an operating theatre of the wooden emergency hospital type, the walls of which have considerable heat-retaining properties. The windows were covered with shutters of wall-board, so that ventilation was almost non-existent. As the sterilizing room communicated freely with the main theatre the latter soon became uncomfortably warm and humid, and, with only one small fan of the suction type, little could be done to control the temperature. The anaesthetic was given with the standard Boyle apparatus, a gas, oxygen, and ether mixture being used. Mackintosh sheets were employed as well as towels to shut off the operation area, with the result that as the patient was completely enclosed with the exception of that portion of his face not covered by the anaesthetic mask and the Clausen harness, little heat loss was possible.

The operation and anaesthesia proceeded smoothly at first, a gangrenous appendix being removed and a suprapubic drain inserted on account of the large quantity of thin purulent fluid found in the abdomen. The operation had been in progress for about half an hour and the peritoneum had, fortunately, just been closed, when ether convulsions began without warning. The patient's body and limbs were shaken by rapid clonic convulsions of moderate severity. Owing to the involvement of the muscles of respiration, cyanosis rapidly developed, and was only partially relieved by administering pure oxygen and applying artificial respiration. A solution of pentothal was quickly prepared and given intravenously, 3 c.cm. (0.15 g.) being sufficient to stop the convulsions with dramatic suddenness, followed by the resumption of normal respiration.

The wound was now rapidly closed and at the same time the rectal temperature was taken and found to be 106.6° F. The coverings were then removed from the patient and tepid sponging of the chest, arms, and legs begun, being continued until the temperature was reduced to 103° F., when the patient was returned to the ward. During the night the temperature continued to fall, and next morning he appeared to have suffered no ill effects from his ordeal. He proceeded to make a complete recovery.

My thanks are due to the medical superintendent of the hospital for permission to publish this case.

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Reviews

X-RAY DIAGNOSIS OF THE GASTRO-INTESTINAL AND URINARY TRACTS

The Gastro-Intestinal Tract. A Handbook of Roentgen Diagnosis. By Fred Jenner Hodges, B.S., M.D. (Pp. 320; illustrated. 33s.) Chicago: The Year Book Publishers, Inc.; London: H. K. Lewis and Co.

The Urinary Tract. A Handbook of Roentgen Diagnosis. By H. D. Kerr, M.D., and Carl L. Gillies, M.D. (Pp. 320; illustrated. $5.50 or 33s.) Chicago: The Year Book Publishers, Inc.; London: H. K. Lewis and Co.

When one sits down to write a book on a medical subject it is well to have clearly in mind the object of the book and, in particular, who it is intended shall read it. This may seem to be emphasizing the obvious; it is, none the less, sometimes overlooked by authors. Witness two of the volumes of the "Handbook of Roentgen Diagnosis" series: The *Gastro-Intestinal Tract*, by Fred Jenner Hodges, and *The Urinary Tract*, by H. Dabney Kerr and Carl L. Gillies.

The object avowed in the preface of *The Gastro-Intestinal Tract* is "to present the subject in a manner most useful to physicians who are not and do not intend to become specialists in the field of roentgenology." Immediately after this preface is a 20-page introduction, largely concerned with the technique of examination, with which the physician has little or no concern. The remainder of the book—about 300 pages—consists of an *x*-ray atlas of the gastro-intestinal tract, with clinical notes of the cases illustrated and brief discussions on *x*-ray diagnostic signs. Many of these are typical cases, others are comparative rarities, and in some the diagnosis is not known. The last might well be omitted from a book of this size. The illustrations are clear and the paper good. The book will be of interest to clinicians who like atlases (and, curiously, some do: in the hope, perhaps, of finding a short-cut to the knowledge of a specialty).

The Urinary Tract also seems to hesitate about what it sets out to do. The authors' aim has been to produce a "low-priced handbook in which the roentgen appearances of the more common and some of the uncommon lesions are available for ready reference to the student, practitioners, urologists, and radiologist." The English price is 33s., and one can't see many medical students in this country buying it; or radiologists either, for whom it is too elementary to be of real value. A notable omission is the subject of intravenous pyelography. In the several hundred illustrations—very good ones and well produced—there are hardly half a dozen intravenous pyelograms. Indeed, throughout the book the hand (and catheter) of the urologist are much in evidence. But there is no doubt that most readers will find the book of great interest. As an atlas it is of high quality, and the letterpress is clear, straightforward, and very readable; and though the reviewer is not quite clear what the book really aims to do, he enjoyed turning its pages, which is more than he can say of many such volumes.

SETTING UP A RURAL HOSPITAL

Small Community Hospitals. By Henry J. Southmayd, Director, Division of Rural Hospitals, the Commonwealth Fund, and Geddes Smith, Associate, The Commonwealth Fund. (Pp. 182. $2.00 or 11s. 6d.) New York: The Commonwealth Fund; London: Oxford University Press.

In 1925 the *Journal of the American Medical Association* declared that the lack of hospitals was a prominent factor in the increasing trend of doctors away from the countryside. The Commonwealth Fund then offered to meet two-thirds of the cost of building and equipping one or two small hospitals each year in areas where the local community would provide sites, management, and maintenance. During the succeeding twenty years thirteen rural hospitals have been established, and this book deals with the experience thus gained. The questions posed were: What communities should have such hospitals; what areas should a hospital try to serve; who should run and staff them; how can they help their public to get better medical care?

The Fund believes that in helping the establishment of these hospitals it is assisting in the solution of a great national problem because the lack of good medical provision is evidently driving people off the land. Its thesis is that, "If 50–100,000 people will use a single hospital placed at the natural centre of a homogeneous trading area, they can have about as good a hospital as the same number of people in a single city." The Fund claims that its experience has proved this thesis to hold good. One difficulty has been the fact that an ideal hospital area by no means necessarily conforms to local authority boundaries, and so all the usual local ambitions and traditions have had to be placated. The six chapters in the book deal in a very practical way with all the points which would confront a rural area considering the setting up of a hospital.

One problem which receives a good deal of attention is how to link up these rural hospitals with the consultant facilities commanded by the great city hospitals. On this question a reference is made to the experience of our Nuffield Trust and its device of the "key" hospital. The opinion is expressed that hospital co-operation in England has long been "bedevilled by the traditional differences between the voluntary and the public institution."

The book ends with the opinion that "in the long run the community will shape the hospital, the health department, and the practice of medicine, to its own purposes, and a great deal of experimentation is going to be needed in the process." The Commonwealth Fund is to be congratulated on a useful contribution to this.

PHYSICAL TRAINING

Médecine, Education physique, et Sports. By Dr. Albert Govaerts. Actualités Sociales. Nouvelle Série. (Pp. 162. No price given.) Brussels: Office de Publicité, J. Lebègue et Cie, 36, Rue Neuve. 1945.

Dr. Albert Govaerts, the Director of the Physical Training Department in Brussels University, has written on physical education and sport in medicine an attractive contribution to a new edition of the "Actualités Sociales," first published between 1904 and 1913. His paragraphs on physical education as a builder of health are clearly written in easy (and therefore good) French and show that his reading has been wide and thoughtful. He describes simply and briefly the bearing of the work of a number of physiologists on the problems that have to be understood by those who set out to train the body, especially during the malleable years of youth. His section on acidosis is particularly interesting. At the beginning of Chapter IV Dr. Govaerts states: "Among the many aspects of life changed by the profound evolution of which we are actually witnesses . . . the health of the youth of our nation is one that demands our urgent attention." This passage is typical of many in this chapter showing a deep regard and love of his country and of youth in particular. It is indeed charitable of Dr. Govaerts to look upon their ordeal as "an evolution"—as in fact it is. The spirit of study and service to youth shines throughout this small book; but with this is given an interesting number of scientific tables, that should prove helpful to students, of the reactions of the adolescent body. A translation of Dr. Govaerts's book into English should find a wide range of readers not only among medical men concerned directly with physical training, but also among educated medical laymen interested in the youth movement.

PLASTER TECHNIQUE

Plaster of Paris Technique in the Treatment of Fractures and Other Injuries. By Lieut.-Col. T. B. Quigley, M.C. (Pp. 107; illustrated. $3.50.) New York: The Macmillan Company.

We lately had occasion in these pages to review a similar book on this subject, and it is interesting to find confirmation by Lieut.-Col. T. B. Quigley of the view that plaster technique is a *craft*, because, as he states, "it can be acquired by anyone with reasonable intelligence and a modicum of manual dexterity, under competent guidance." The present book is, we think, the best of its type that we have seen; for it does provide that guidance with simplicity and efficiency. It relates for the most part to the use of plaster-of-Paris in the treatment of trauma, particularly under military conditions. It shows how, in the absence of elaborate equipment and plaster tables, it is possible by careful improvisation to obtain perfect results. Even the most experienced workers with plaster-of-Paris using the most up-to-date equipment will probably find much to learn from Lieut.-Col. Quigley's common-sense approach to the matter. The book is well printed, perfectly illustrated, and packed with sensible information.

Notes on Books

Poet Physicians: An Anthology of Medical Poetry written by Physicians, has been compiled by MARY LOU MCDONOUGH, and is published at $5.00 by Charles C. Thomas, of Springfield, Illinois, U.S.A. The task was heavy but congenial, and though a lot of poor stuff is included there are also some lovely short pieces. Mrs. McDonough tried to restrict the scope of the book to "medical poetry," but she has been hard put to it to find any lines by, for example, Keats or Goldsmith which could come within that definition. By contrast, "On a Dead Child," by Robert Bridges, one of the most poignant poems in our language, could probably only have been written by one who had been a children's physician, as Sir Arthur MacNalty said lately in his address on "Medical Poets." From the great but scattered mass of verse, bad and good, composed by medical men through the ages, Mrs. McDonough has chosen enough to make an agreeable bedside book. Each of the 110 authors held in her net is introduced with a brief biography, and the volume ends with a memorandum on medical poets by Dr. Merrill Moore, a selected bibliography, and a cumulative index of poet-physicians running to 12 columns of small type. The preface, dated Washington, Nov. 15, 1944, makes grateful acknowledgment to much help from many friends. To anyone who carps at her final choice out of an enormous field the compiler can fairly rejoin (in the words of Dr. Moore) that most medical verse is junk, that she has found this out, and that she has spared the reader 20 poems for every one included; also (in her own words) that she has tried to bring together representative poems from as many languages and from as many eras in the history of medicine as space and exigency make possible.

Dr. LYNN THORNDIKE, of Columbia University, has devoted scholarship of a high order to editing *The Herbal of Rufinus*, and the result is a handsome book published by the University of Chicago Press. Mr. Francis S. Benjamin junior transcribed the Latin text from a rotograph of the Rufinus codex of the late thirteenth century and traced most of the citations under the direction of the editor, who supplies a learned introduction and five classified indexes. Although the book of Rufinus remained unknown to modern scholars and to historians of botany and of materia medica until Dr. Thorndike saw the manuscript in 1931 at Florence, it is a work of originality and independent value. Another reason for making his *De Virtutibus Herbarum* available in printed form is that in its quotations from past authorities Rufinus introduces the reader to a hitherto unknown version of Dioscorides. The agents for the book in this country are the Cambridge University Press and the price is 30s.

Dr. R. R. TRAIL'S little book *Chest Examination* was written mainly to correlate the anatomy and physiology of the lungs with the physical findings—clinical and radiological. It first appeared in 1943, with a foreword by Sir Walter Langdon-Brown, and now comes to us in a second edition. Illustrative skiagrams have been added, and there are some changes in the order of the text. The illustrations, half-tone or line block, now number 100. J. and A. Churchill are the publishers and the price is now 12s. 6d.

Dr. ALBERT H. ROWE, of San Francisco, whose writings on allergy are well known to workers in that subject, has produced a second edition of his handbook *Elimination Diets and the Patient's Allergies* (Kimpton; 17s. 6d.). So many changes and additions have been made that the text is now entirely reset. Dr. Rowe continues to insist that his trial diets for the identification of possible food allergy should be used as a diagnostic aid, just as blood counts and other laboratory tests are employed in routine clinical pathology, and that detailed menus and special recipes are needed to make possible the total exclusion of all foods eliminated from the diet. He discusses the whole matter in great detail, and in this edition the instructions for elimination diets have been modified to meet wartime shortages of various foodstuffs.

The *Garnered Sheaf* is a little book of verses by Dr. J. SACKVILLE MARTIN, published at 3s. 6d. by Arthur H. Stockwell Ltd., temporarily housed at Ilfracombe. Many of the short poems are reprinted from the *Poetry Review* or from *Poetry of To-day*. The author has a turn for occasional verse in varying forms; the language is simple, and the mood ranges from tender meditation to playfulness.

The Friends Ambulance Unit has issued from 4, Gordon Square, London, W.C.1, a report of the work done in Europe and the East in September, October, and November, 1945. The F.A.U. comprises 700 men and women who have organized themselves for the relief of suffering wherever it occurs. The first winter of peace is expected to be a period of more widespread misery than any of the wartime winters.

Preparations and Appliances

A CORRECTIVE SPLINT FOR PARALYSIS OF THE THENAR MUSCLES

Mr. J. RUSSELL NAPIER, M.R.C.S., registrar P.N.I. Unit, and chief assistant Orthopaedic Unit, Hill End Hospital (St. Bartholomew's), St. Albans, writes:

This splint is designed to maintain the thumb in a position of function when the thenar muscles are paralysed and at the same time to allow the antagonist muscles to be exercised.

The splint is built round a spong-rubber wedge covered with soft leather that fits into the first interosseous cleft, maintaining the thumb in abduction. The wedge is anchored in position by two leather rings that slip over the index finger and thumb. Attached to the volar-radial aspect of the thumb ring is a strip

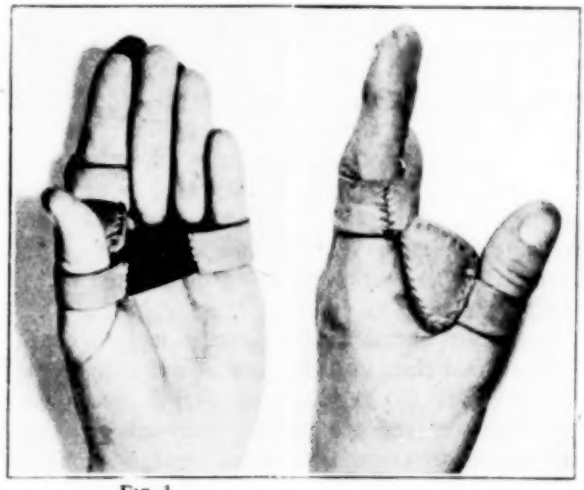

FIG. 1

FIG. 2

of elastic (approximately 2 in. × 3/4 in. : 5 × 2 cm.) which terminates in a third leather ring which fits over the little finger. The leather ring for the index finger should fit loosely enough to allow it to rotate round the finger when the thumb is abducted (Fig 3).

FIG. 3

When the splint is in position the thumb is maintained in the mid-position of rotation (Figs. 1 and 2). The flexibility of the wedge allows a certain degree of palmar abduction and the stretch of the elastic allows a full range of radial abduction (Fig 3), both these movements being performed against resistance.

Its construction throughout of soft materials eliminates the risk of pressure disturbances on insensitive bearing areas of skin, and permits a complete freedom of all unaffected movements of the wrist and hand.

A criticism that might be levelled against the splint is that it has no fixed anchorage, with the result that the little finger tends to be pulled into flexion and rotation at the metacarpophalangeal joint. Providing that the hypothenar muscles are unaffected, as they would be in a pure median palsy, the disadvantage is very slight and easily outweighed by the advantages of a flexible splint.

I wish to thank Messrs. Beckett and Bird Ltd., of 8, Bentinck Street, London, W.1, for their co-operation.

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THE STATE OF THE PUBLIC HEALTH

The health of England and Wales as measured by the statistics given in the Summary Report of the work of the Ministry of Health for the year ending with last March[1] would be a matter for congratulation at any time, but for this country to achieve such a state in the second half of the fifth and the first half of the sixth year of war is indeed remarkable. The year covered by the report extends from a short time before the invasion of Normandy almost to the end of hostilities in Europe—a period during which the war was at its grimmest, public anxiety at its height, and hardships and shortages felt most severely. The E.M.S. hospitals were already filled with the early instalments of nearly 150,000 casualties and sick from the advancing armies in Western Europe when they had to accommodate the victims of flying bombs and rockets in Southern England to the total number of 22,000. The first-aid posts of the London region had to deal with 38,000 air-raid cases in those summer and autumn months of 1944; over 100,000 homeless people passed through the rest centres, and one and a quarter millions migrated from the danger areas. In London itself, on some nights, not far short of half a million were sleeping in public shelters, and as many as 80,000 in tube railways. The presence of some thousands of refugees and the increasing numbers of British repatriates from the liberated territories complicated the problem of the public authorities. These perils to the health of the people had to be combated by a medical and nursing profession greatly diminished in numbers. One-fourth of the general practitioners of the country and one-fifth of the medical officers of the public health services were in the Forces. The local authorities were carrying on with a net shortage of 50,000 people on their staffs as compared with 1939; they were particularly handicapped by lack of professional and technical officers. Yet in such a year not only did the general death rate fall as compared with the year before but the maternal and infant mortality rates, and the mortality rates for the second, third, fourth, and fifth years of life, were the lowest ever recorded. With the exception of dysentery, the incidence of which has been gradually rising for a decade in this country, all the principal infectious diseases showed fewer notifications—notably diphtheria, measles, and pneumonia, which included influenza with pneumonic complications. Even tuberculosis, both in notifications of new cases and in deaths, and venereal diseases, in the numbers dealt with at the clinics, regressed a little, though, of course, both tuberculosis and venereal diseases were well above pre-war level.

[1] *Summary Report of the Ministry of Health for the Year ended, March* 31, 1945. Cmd. 6710. London: H.M. Stationery Office. (1s. 3d. net.)

To give a few figures: the infant mortality rate in 1944 was 45.7 per thousand live births, and the death rates in the next four years of life were 4.6, 2.6, 2.2, and 1.8 per thousand living; the lowest levels previously were 49.1, 5.8, 3.1, 2.4, and 2.0 respectively. The birth rate was 18.0, but this is based on the mid-1939 population and is subject to modification when the 1944 population is ascertained. The rate has not reached 18.0 since 1925; in the last year of the first European war it was 17.7. The maternal mortality rate was 1.95 per thousand total births, or 1.54 if deaths from abortion are excluded. Of the mothers who had babies during the year 76% had attended the ante-natal clinics, which now number just upon 2,000 in England and Wales, or had received ante-natal care through the welfare authorities' arrangements. Particulars are given in the report of the daily food value of the expectant mother's augmented rations and priority allowances, amounting to 67 g. proteins, 1,450 calories, 1,030 mg. calcium, 5,610 i.u. of vitamin A and 900 of vitamin D, and 39 mg. vitamin C. The vital statistics concerning mothers and infants in the war years are the most encouraging feature of the whole survey:

Year	Maternal Mortality Rate per 1,000 Total Births	Infant Mortality Rate per 1,000 Related Live Births	Stillbirth Rate per 1,000 Total Births	Neonatal Mortality Rate per 1,000 Related Live Births
1939	3·10	50·6	38·1	28·3
1940	2·60	56·8	37·2	29·6
1941	2·76	60·0	34·8	29·0
1942	2·47	50·6	33·2	27·2
1943	2·30	49·1	30·1	25·2
1944	1·95	45·7	27·7	24·5

The figures for 1944 are provisional. The illegitimacy rate is a less pleasing feature. It has gone up from 42 per thousand live births in 1939 to 72 in 1944.

For the third year in succession there was a decrease in both notifications of and deaths from diphtheria. In 1944 both the notifications, which were just upon 30,000, and the deaths, which were fewer than 1,000, were the lowest ever recorded. During the ten years before the war the average annual figures for notifications were twice, and those for deaths more than three times, as high. It is noteworthy that this decline took place at a time when diphtheria of a most severe kind was widespread in Europe. The number of children immunized under local authority arrangements during the year was 561,314. It is estimated that the number of children under 15 in England and Wales at the end of 1944 was 8,714,000, of whom between 60 and 65% had been immunized. The number of deaths from respiratory tuberculosis was 20,104, against 21,342 in 1943. The most serious problem concerning tuberculosis is the present inadequacy of institutional treatment, principally because of shortage of nursing and domestic staff. Up to the end of March, 1945, over 400,000 persons had been examined under the mass miniature radiography schemes, of whom 1 in 100 was suspected of being tuberculous or was definitely found to have tuberculosis. In venereal diseases, more encouraging than the slight improvement in the number of new infections is the number of new patients examined who have been found not infected. The war has delayed the develop-

ment of long-term schemes for the treatment of cancer under the Cancer Act, 1939, but some schemes are now well advanced. A North of England regional scheme based on Newcastle was submitted for the Minister's approval during the year. The Liverpool scheme has extended the area of its operations. Machinery for the preparation of draft schemes was set up during the year in Oxford, Leeds, and Sheffield, and preliminary activities were in progress in the regions centred on Birmingham, Cardiff, and Bristol. The number of deaths from cancer during the year was 72,110, almost exactly the same number as the year before. One person in rather more than seven dies of cancer.

The main statistics given in this report relate only to illnesses which have caused death or which are notifiable. The mass of minor ailments which in the aggregate accounts for the major invalidity of the nation goes unrecorded, and any complacency we may feel must be halted by this fact. Until recently the only information about the extent of minor sickness came from approved societies, but since January, 1944, about 2,500 civilians, selected at random, have been interviewed each month through the Wartime Social Survey of the Ministry. A detailed history was taken of all departures from health during the three months preceding the interview. Out of every 1,000 civilians between 16 and 64 only four were reported to have had one or another of the notifiable diseases during 1944, and about six were registered as having died. But in a particular sample of about 5,000 people of those ages it was found that during an average three-months period six out of ten had had some illness, not necessarily requiring absence from work, or had complained of a minor ailment of some kind. In the period November, 1944, to February, 1945, out of 100 men and women, 18 men and rather more than 18 women had had colds or influenza, and about four of each sex had been incapacitated. The Minister draws attention in his foreword to one other check to complacency. He points out that it is not at all certain that the improvement in vital statistics will be maintained. Continued vigilance is the condition not only of liberty but of health. Reaction after war strain may be more disastrous to health than war strain itself. Moreover, what Mr. Bevan describes as an "increasingly critical situation" has to be faced in the shortage of nurses, midwives, and domestic workers for hospitals, sanatoria, and maternity homes. The beds, he says, are there in plenty (though that does not seem to be the opinion of some at least of the Ministry's surveying officers who have been gathering information about hospital facilities all over the country); it is the personnel which is lacking.

Among other points of interest in the report we note that 8,000 people in areas subject to enemy action, factory workers, and others of all ages in various parts of the country have been examined from a nutritional point of view, and the findings indicated that the state of nutrition was well maintained. The regulation making jaundice notifiable in the Eastern Civil Defence Region continued in force and 3,552 cases were notified—an attack rate of 1.3 per thousand population. Nine cases of malaria contracted in England were reported during the year—two at a naval establishment in Devonshire, three at Aldershot, and four in the county of Surrey. Periodical inspection of the static water tanks in the London area (since drained) showed only a small number to be infested with mosquito larvae, the species being *Culex pipiens*, which does not bite human beings. During the year 669,000 gifts of blood were made to the Emergency Blood Transfusion Service. The Service's contribution to the Navy, Army, and Air Force for use over-seas amounted to 50,000 bottles of whole blood, 31,000 bottles of dried plasma or serum, and 9,000 2½-litre winchester bottles of unfiltered plasma and serum. The number of banks of whole blood maintained at hospitals and other blood centres was 441, and in addition there were 33 banks of Rh-negative blood.

The report is unusually interesting this year because information can now be given of the measures taken to deal with the results of air raids. The full story of the war refugee scheme since it started operation early in 1940 is also told. One chapter is headed "Reconstruction," but the reference to the proposals for a National Health Service is only an account of events which occurred in the Willink era. The Minister says that the road to a fitter Britain is now clearly marked. The present major task of his Department is "a great drive to provide, as quickly as is humanly possible, the good housing on which the health and happiness of the people so largely depend."

PENICILLIN IN OPHTHALMOLOGY

In diseases of the eye infective processes are largely confined to the outer eye, and the various forms of purulent ophthalmia are classical examples; infections of the inner eye, such as panophthalmitis, are on the whole rare. Most inflammations of the eye, of which iritis and choroiditis are characteristic, do not produce pus, and the inflammatory exudate does not contain organisms. These distinctions in ocular pathology have been well established for many years, but they gained added significance when the sulphonamides were introduced. It was found that the purulent infections of the outer eye responded readily to general sulphonamide therapy, but, while gratifying results were occasionally obtained in cases of iritis and iridocyclitis, the intraocular inflammations generally responded but poorly. Since the sulphonamides easily penetrated the interior of the eye, since adequate concentrations of the drug could be obtained, and since the response in frank infections was better than in serous uveitis, it became clear that the whole problem of intraocular inflammation required reassessment in the light of the new and positive knowledge. The sulphonamides have marked limitations. Though some experimental evidence has been advanced that they are effective in infections of the outer eye when used locally, it cannot be said that there is any real clinical support for these observations. It is questionable whether an adequate experimental lesion of the outer eye has yet been evolved, and there is little justification for the widespread and misguided use of the sulphonamides locally in such infections, while their local use for infections of the interior of the eye has never seemed justifiable in view of their ready penetration through the blood-aqueous barrier. Sulphonamide therapy in eye disease is thus largely oral administration of the drug.

Experience with penicillin in many respects runs counter to that obtained with the sulphonamides. The same fundamental distinction between infection and inflammation has

still to be drawn, but in contrast to the sulphonamides penicillin does not readily penetrate into the interior of the eye when administered intramuscularly. This has been shown experimentally,[1-3] and has been confirmed in man.[4 5] There is no evidence that in the inflamed eye the barrier is less absolute,[3] but it appears that the intramuscular administration of penicillin in very many times the dosage currently used might allow some penetration of the drug into the eye.[1] Attempts to obtain more satisfactory penetration by procedures which either delay the excretion of penicillin or modify the blood–aqueous barrier still require fuller study. For the present it must be accepted that the use of penicillin intramuscularly, in contrast to general sulphonamide therapy, has but little scope in infections of the inner eye. A further contrast is in the local action of penicillin. Since penicillin is not inactivated by pus or peptone, as the sulphonamides are, it has proved invaluable as a local medication. This has been brought out in many reports on the use of penicillin locally in acute conjunctivitis, in blepharitis, and in various septic inflammations of the outer eye. The most extensive work on these lines has been recorded in our columns in two papers on ophthalmia neonatorum.[6 7] However, it cannot be said that the many problems of the local use of penicillin have been solved. Local medication with penicillin requires knowledge of the limits of tolerance and of means for maintaining adequate concentrations. Clinically the limits of local tolerance with the available samples of penicillin have been found to be at about 2,500 units per c.cm. when used in the form of drops. Ointments have not so far been employed widely, as no adequate base has been available. Most of the penicillin ointments were quickly inactivated and became irritants rather than therapeutic agents.[8] It is possible that this difficulty has now been overcome and more use may be made in the future of penicillin ointments and creams, though limits of tolerance to, and absorption from, such ointments have still to be established. Since penicillin fails to pass the blood–aqueous barrier, it is tempting to inject it directly into the aqueous and vitreous, but it seems that only relatively small quantities can be so injected without damage. The limit of tolerance of the anterior chamber is probably about 200 units, and perhaps rather less for the vitreous.[9] Experimentally it has been found that massive quantities of penicillin injected into the vitreous produce extensive damage.[9 10] A less drastic procedure is subconjunctival injection, and though relatively large quantities have been used by some observers[11] it appears that the limit of tolerance is again relatively low—injections of about 600 units repeated daily.[9] With any of these methods concentration and the maintenance of concentration are poor. Drops are soon washed out from the conjunctival sac, and excretion from the anterior chamber of any injected penicillin is rapid. Penicillin introduced into the vitreous persists for considerably longer, possibly for more than 48 hours,[5] but injected subconjunctivally it is probably excreted in a matter of hours. The difficulties in obtaining and maintaining adequate concentrations by means of local applications are therefore considerable. These difficulties are illustrated by the studies recorded on ophthalmia neonatorum.[6 7] Here penicillin in a concentration of 500 units per c.cm. instilled in the form of drops gave less satisfactory results than penicillin in double that concentration, while 1,500 units per c.cm. gave better results still, and with a concentration of 2,500 units per c.cm. recovery became the rule. Instillations at intervals of half an hour gave better results than hourly instillations, while remarkably rapid clearing of the infection took place when penicillin was instilled at intervals of five minutes. Even better results may be expected when penicillin is administered almost continuously—that is, at intervals of one minute for half an hour.[12]

It is generally accepted that penicillin, like the sulphonamides, is ineffective against virus diseases. There is, however, ample evidence that the sulphonamides are effective against some of the larger viruses, such as those of lymphogranuloma inguinale and rat pneumonitis. They have also proved invaluable in trachoma and in inclusion blennorrhoea. Successes with local penicillin in inclusion blennorrhoea[5 7] suggest that it may also prove of value in trachoma—and presumably in other infections due to the larger viruses; and, indeed, promising results are already on record.[9 13 14] In contrast to the uncertainty as to the action of penicillin on viruses is its established efficacy against the spirochaete. The possibilities thus opened in the treatment of ocular syphilis have as yet scarcely been explored.[9 15] For the present the scope of penicillin in ophthalmology seems confined to its local use in external infections of the eye. Little is to be hoped for from general administration, while the introduction of penicillin directly into the eye still presents many difficulties that require intensive study. But if methods for the direct introduction of penicillin into the eye are evolved, then in many conditions treatment by the oral administration of sulphonamides may well be replaced by the local application of penicillin.

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HEALTH OF FACTORY WORKERS IN 1944

In the report of the Chief Inspector of Factories for 1944[16] Dr. E. R. A. Merewether, the senior medical inspector, is responsible for a very full and detailed article on "Industrial Health." It forms, in fact, nearly a third of the whole report, and Dr. Merewether points out that an increase in the importance of industrial health is evident in many ways. Several universities are establishing departments of industrial health, fellowships are being provided for those who wish to qualify for teaching and research posts, and the Medical Research Council has set up research units at several centres. Most industries can be improved so far as health and safety are concerned, and Dr. Merewether maintains that it is essential for industrial research and industrial health research to be closely integrated on a national scale.

16 Annual Report of Chief Inspector of Factories for 1944. Cmd. 6698. H.M. Stationery Office. (1s. 6d.)

The statistical tables given in the report show that in 1944 lead-poisoning cases reached the lowest annual figure on record, and for the first year since official figures have been kept no case of poisoning in the pottery industry was notified. What a contrast with the experience of 1900, when no fewer than 210 cases were recorded! Perhaps the chief protecting factor is the almost universal adoption of leadless or low-solubility glazes. The poisonous effects of T.N.T. were distinctly less marked than in 1943, there being 36 cases of "anilism"—i.e., haemolytic action on the red blood cells evidenced by cyanosis and shortness of breath—11 cases (1 fatal) of toxic jaundice, and 6 cases (5 fatal) of toxic anaemia. The cases of epitheliomatous ulceration of the skin numbered 205 (20 fatal), and showed a substantial rise on 1943, when they were 160 (15 fatal). Of the 45 cases due to mineral oil, cotton mule spinning contributed 38 (13 fatal), and it is much to be regretted that the effective modern methods of treatment in the early lesions of the skin from agents known to be carcinogenic were not always employed. The cases of gassing numbered 450 (25 fatal), and were only about two-thirds as numerous as in the immediately preceding years, those due to nitrous fumes being only about a fourth as numerous.

The subject of pneumoconiosis is discussed at some length, and Dr. Merewether points out that it is only by studying the cases statistically over many years in relation to the causative industries and processes, and to economic factors such as housing and nutrition, that it will be possible to assess the relative risks and the progress achieved in reducing them. One table sets out particulars relating to 1,750 fatal cases of silicosis, with or without tuberculosis, and 190 fatal cases of asbestosis, which have been investigated by the Factory Department since 1929. The average duration of employment in the cases of silicosis was 34.0 years, and in cases of asbestosis 15.1 years, the averages when these diseases were complicated by tuberculosis being 31.3 and 10.4 years respectively. In some cases it has been possible to replace siliceous by non-siliceous materials—e.g., in grinding wheels for metals, and by substituting alumina for flint in placing china. In other processes measures have been adopted to reduce dust, and these and other factors have resulted in a distinct lowering of mortality. A comparison of 1935–8 with 1941–4 shows that the yearly mortality in the pottery industry fell from 52 to 41, and that in sandstone industries from 95 to 67. However, deaths from fibrosis of the lung observed in coal-mining have gradually increased.

The report gives a detailed account of the latest observations on the effects of radio-active substances. The number of luminizers employed has risen steadily from year to year, and in 1944 they amounted to 561. The National Physical Laboratory examined them by a dental film test, and found that almost all were exposed to less than 1.0 roentgen per week. In half a dozen firms, however, groups of workers were exposed to much heavier dosages, in some cases exceeding 5.0 roentgens per week, and the causation of the excesses is discussed. The health of 450 of the luminizers was investigated by Dr. Ethel Browning and was found to be remarkably good. The incidence of slight dermatitis of the skin of the fingers around the nail was considerably less than usual, owing chiefly to the use of a protective paint container, and the requirements of a Factories Order prescribing for all luminizers an interval of three months' removal from contact after one year's continuous employment. Disturbances of the blood picture were slight in character, and showed no tendency towards aplastic anaemia.

Medical and nursing services in industry continued to develop in efficiency. At the end of 1944 there were 180 doctors exercising full-time medical supervision in 275 factories, and 890 exercising part-time supervision in 1,320 factories. There were about 7,600 women nurses and 200 male nurses. The Docks Medical Services continued to develop and were highly successful. For instance, at Liverpool 9,034 new cases were dealt with, two-thirds of them relating to dockers. In summarizing his report Dr. Merewether emphasizes the immensity of the scene portrayed, and the widespread interest in industrial health evinced by all sections of the community.

THE METRIC SYSTEM

In a letter from Istanbul Prof. W. C. W. Nixon[1] made in our columns a plea for the adoption of the metric system in medicine. Other correspondents supported him, and if there were any whole-hearted advocates of the imperial and apothecaries' units they remained silent. The metric system is used universally in scientific work, and for all purposes in many countries, and it has the merit of practical simplicity. There are other good reasons for adopting this system in medicine. Sulphonamides are already prescribed and dispensed metrically, and so are numerous other drugs which have helped to alter prescribing habits. Doctors who have been abroad during the war and have had to use the metric system in prescribing seem to have done so without much difficulty.

An abrupt change to the exclusive use of the metric system would lead to confusion, but it seems that the time is ripe for the introduction of the metric system throughout the *Journal*. One of the principal reasons for doing this now is to enable the medical man abroad to read the *Journal* in terms of the system of weights and measures familiar to him. More than 15,000 copies of the *Journal* are sent abroad each week, and the foreign doctor is looking eagerly to this country for professional and technical information. We hope, too, that increasing familiarity with the metric system will encourage British doctors to hasten the end of a system which isolates us from the rest of the scientific world. Metric equivalents will be inserted parenthetically after each old-style dose, weight, and measure from this issue onwards. This is the beginning of a phase of transition which we optimistically hope will end in the general use of the metric system in British medicine. How long this phase will last remains to be seen, but in the United States the same transition phase has recently ended.[2] It began in 1900, which is a sobering thought.

The War Office has announced releases of doctors from the R.A.M.C. for January and February as follows:—General duty medical officers: Groups 25–30 in January; Groups 31–38 in February. Specialist medical officers: Groups 25 and 26 in January; Group 27 in February. The greater age of entry of specialists has the effect of bunching the majority of specialists into the first thirty groups. The release of specialists in Groups 1–27 is proportionately equivalent to Groups 1–38 in the case of general duty medical officers. The Central Medical War Committee is taking steps with a view to securing the recruitment of further specialists to enable releases to proceed at a proportionate rate with general duty medical officers.

The first part of the New Year Honours List is published while this number of the *Journal* goes finally to press, and we must, therefore, wait a week to announce the medical names, of which there are many.

[1] *British Medical Journal*, 1944, **2**, 320.
[2] *J. Amer. med. Ass.*, 1943, **123**, 900.

OCULAR SIGNS IN THE PRISONER OF WAR RETURNED FROM THE FAR EAST

BY

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Large numbers of men released from Japanese prison camps will soon be arriving in this country. At a military ophthalmic centre we have during the past two months examined some 30 men who were released at the recapture of Rangoon. They had all been prisoners of war for from two to three years. During this period they had been compelled to do hard manual work on a wholly inadequate diet, the bulk of which was rice. They had no headgear and little or no protection against the sun. Those who wore glasses had these removed when captured, and they were never replaced. The majority had suffered from dysentery (26 cases), malaria (15 cases), and beriberi (27 cases). The following ophthalmic case records of these men are submitted as a basis for discussion.

Report on Cases of Beriberi

Two of the men had suffered from "wet" beriberi, and three others had had both "wet" and "dry" forms of the disease. The other 22 had "dry" beriberi. The average duration of the disease was six months, and most of the men had noted that their sight was failing towards the end of their illness.

Ocular Signs.—On examination 10 cases were found to have bilateral central scotomata. In not one of these 10 was there contraction of the peripheral visual field either to white or to colours. There was no constancy in their colour scotomata. Five of the 10 had a degree of visual failure which prevented their corrected vision being brought above 6/60. The ophthalmoscopic examination of these 10 cases revealed that all 20 optic disks showed some degree of pallor. In the eight cases presently to be described four of the optic disks showed an apparent primary optic atrophy: four showed pallor of the papillo-macular bundle; in the remaining eight optic disks there was pallor of the temporal half. The four cases of apparent atrophy had pupils that were relatively enlarged, but these pupils retained their normal reactions to accommodation.

Among the 20 cases without scotomata, one man alone showed some difficulty in convergence: he had a long-standing defect in one eye—"amblyopia ex anopsia." The cases with scotomata did not reveal evidence of ocular muscle paresis. Another of those without scotomata achieved bilateral vision of 6/9 on correction. He stated that at the time of his "dry" beriberi he had suffered from a considerable amount of photophobia. He was treated with a "kind of bran," and indeed was the only man to receive anything but the most crude type of medication in captivity. His ocular symptoms had disappeared with the cure of the beriberi.

Earlier this year we examined two men who showed leucomata but no optic nerve degeneration as a cause for visual failure. They had been for a long period prisoners of war of the Japanese, and had been rescued by a submarine that had torpedoed their prison ship. They attributed their eye condition to the long period of immersion in the oily sea.

It is of some interest that not one of the 30 men examined in this series showed ocular signs of ariboflavinosis. Yet during the same period we have seen two men back from German prison camps who, though they did not have beriberi, had a definite increase of limbal vascularization. The accompanying table summarizes the detailed investigation of eight of the ten cases of bilateral central scotomata.

Discussion on the Cases

General.—Elliott (1920) states that beriberi is mainly a disease of the young adult of between 16 and 30 years of age. In Japan the disease is apparently most common in the hot weather from July to September; while the ocular manifestations are most often seen in November, December, and January. Out of 6,000 patients examined by Ishihara, 32 showed amblyopia; 6 of the cases of amblyopia were due to beriberi. Elliott does not, however, say how many of the cases had bilateral amblyopia. Maynard of Calcutta associated glaucoma but not optic atrophy with "wet" beriberi. We have no evidence to offer in connexion with this point.

Retrobulbar Neuritis.—In 1895 Kono stated that the characteristic ocular signs of beriberi were: (*a*) central scotoma, (*b*) amblyopia, (*c*) contraction of the visual field. Elliott adds that as the scotoma increases the central vision rapidly falls to 6/60, but thereafter remains relatively constant. There has been considerable disagreement as to the constriction of the peripheral visual field. Coppez definitely states that there is no contraction. Ishihara says that it occurs, but only transiently. Yamaguchi claims that there is only constriction in the red and green peripheral fields.

Fundus Appearance.—Yamamoto states that there may be: (*a*) no apparent fundus lesion; (*b*) partial optic atrophy, limited to the temporal quadrant; (*c*) the whole optic-nerve head may show atrophy. Ishihara states that the papillo-macular bundle is most often affected.

Scotomata.—The resemblance of the scotomata of beriberi to those due to tobacco-alcohol, lead, quinine derivatives, and general cachexia was early recognized. Miyashita described the scotoma as "pestle-shaped," and said that it connected the blind and fixation spots. Aoki and Yamamoto stated that the colour scotomata lay within the white scotoma, in the following order of diminution: green, red, and blue. Over this point there has been much dispute. Miyashita says that the colour sense is often disturbed, especially for green. In our series there was a "tail" to the white scotoma leading from the fixation spot towards an enlarged blind spot. There did not appear to

Table giving Details of Eight Cases of Bilateral Central Scotomata

Patient	Age	Unaided Vision	Aided Vision	Date of Capture	Length of Captivity	Beriberi			Malaria	Dysentery	When Sight Failed	How Affected	Remarks
						Type	Duration	Onset					
A	27	Rt. 6/18 Lt. 6/18	6/18+ 6/18+	12/3/42	3 years	Dry	7–8 months	March, 1943	Yes	Yes	April, 1943	Centre of objects blurred	Scotoma of rt. eye absorbs blind spot
B	31	R. <6/60 L. <6/60	<6/60 <6/60	24/2/42	3 years	Dry	7 weeks	April, 1943	4 attacks	No	April, 1943	Vision decreased before paresis appeared	—
C	26	R. 6/18 L. 6/60	6/9 6/36	12/3/42	3 years	Dry	—	Jan., 1943	2 attacks	Yes	Nov., 1943	Not recognize people 30 yds. and near sight	"Tailed scotoma"
D	23	R. 6/36 L. 6/36	6/24 6/18	29/3/43	2 years	Dry	6–9 months	Jan., 1944	Several attacks	Yes	Early 1944	Rapid onset; people's faces blurred, rest clear	"Tailed scotoma"
E	23	R. 6/60 L. 6/36	6/36 6/36	28/12/43	2¼ years	Wet Dry	4 months	Dec., 1944	No	Yes	After beriberi	Noted gradual bilateral failure	"Tailed scotoma"
F	29	R. 6/60 L. <6/60	6/60 <6/60	Uncertain	3 years	Dry Wet	6 months	Sept., 1943	Yes	Yes	?	?	"Tailed scotoma"
G	29	R. 6/60 L. 6/60+	6/60 6/60+	12/3/42	3 years	Dry	8 months	Dec., 1942	No	Yes	Before beriberi	Noted improvement since repatriated	"L.E. tailed scotoma"
H	31	R. IV/60 L. IV/60	6/60 6/60	20/12/42	2¼ years	?	?	?	Yes	Yes	12 months after capture	—	—

be any "nuclei" lying between the blind and fixation spots. Our colour scotomata were inconstant.

Paresis of Ocular Muscles.—Manson states that such pareses are rare. Yamaguchi found all types of paresis and, above all, that of accommodation. Stitt merely states that there is no Argyll Robertson pupil. Da Silva Lama in his Brazilian cases noted paresis of the sixth cranial nerve. Elliott found ptosis, and noted that most Japanese authorities agreed that there was some paresis of the sixth cranial nerve. We found no paresis in the 10 cases with scotomata.

Diminution of Sensitivity of the Cornea and Conjunctiva.—In 1918 Ishizu referred to such diminished sensitivity. In 1899 Tzurumaru associated retrobulbar neuritis with xerosis and xanthopsia. In 1930 Oguchi reported cases of superficial keratitis with a coincident retrobulbar neuritis in which there was a deficiency of vitamin A. We found no diminution of sensitivity in our series, neither was there evidence of xerosis. Photophobia had been noted by one man, but no xanthopsia or hemeralopia.

"Dry" Beriberi: Pathology; Prognosis; Treatment

The pathological findings in the central nervous system are: demyelination, haemorrhages, and subacute inflammation of the white nerve-fibres and their surrounding membranes. Some axis-cylinders are found to be fragmented. In regard to the muscle paresis, Wright noted "a mild chromatolysis in the trophic cells of the affected nerve-fibres" (Nissl). Kagoshima, on post-mortem section of five cases that had shown scotomata, found a "distinct and limited atrophy of the fibres in the outer section of the optic nerve in all of them."

Miyashita holds that the poorly nourished individual is the most likely to develop eye symptoms. But even in the worst cases the central vision rarely falls below 6/60. Elliott only states that complete blindness need never be anticipated. The men of our own series of cases had been told that their sight might recover in the next eighteen months. We have been unable to find an authority for this prognosis. Even allowing for slight improvement due to diminution of inflammation, surely the damage to the optic nerve itself is irreversible. Also the prognosis in cases of bilateral retrobulbar neuritis from other causes is always gloomy.

Elliott states that in Japan it is usual to stop the intake of rice and to substitute a bean called "azuki" (*Phaseolus radiantus*). Aoki states that under this regime the scotomata rapidly diminish, only to return when the ingestion of rice is resumed. Yamamoto combined barley with the bean diet, and Yamaguchi claimed a total recovery of all eye symptoms in one case after a month's dieting. Elliott claims that "if this rational line of treatment is not adopted the prognosis is a bad one."

Vitamin Deficiency

All the early authors apparently associated beriberi with the removal of the pericarp of the rice in the process of "polishing." This removal of vitamins B_1 and B_2 has now come to be regarded as the main cause of the nerve signs. Lindsay Rea (1938) quotes Fitzgerald Moore (Nigeria, 1934) as noting that a deficiency of both vitamins A and B produced an optic neuritis. He states also that in the Philippines a lack of vitamin B was responsible for keratitis. Deficiency of vitamin A may lower the standard of resistance to infection, but it is not responsible for neurological signs (Woolbach). Hemeralopia was not one of the symptoms that our patients complained of, neither had they signs of xerosis. Komoto reports one case with hemeralopia and scotoma of 18 years' duration. Vedder, in 1940, stated that diets deficient in vitamins A and B_2 cause nerve degeneration, and postulated an "X" cause for "dry" and "Y" for "wet" beriberi. But pellagra patients (B_2 deficiency) seldom show optic atrophy.

The modern theory of the causation of tobacco-alcohol amblyopia holds that defective intestinal absorption is responsible for a deficiency of vitamin B_1 and that this deficiency is responsible for the consequent optic atrophy. Vitamin B_1 is not stored in the body, and the daily requirements of the adult are from 300 to 750 i.u. In hot climates there is increased consumption of B_1, especially when the subject is engaged in hard manual work. The intestinal upset of dysentery will prevent the absorption of B_1, and a starchy diet will make a B_1 deficiency manifest itself earlier. Rice that has gone mouldy loses most of its vitamin content. But increased vitamin B_1 in the diet will not restore visual function in either beriberi or tobacco-alcohol amblyopia, although the peripheral nerve symptoms of beriberi are ameliorated.

We feel, with Meiklejohn (Stitt, 1942b), "that the exact nature of the deficiency of nutritional neuritis remains obscure," but we do regard the damage done in beriberi to the optic nerve (a true portion of the C.N.S.) as final.

Conclusions

We trust that we have shown a relationship between the scotomata to white in our series of cases and those of the toxic amblyopias. The question of the shape of the colour scotomata can be settled only after examination of several hundred cases.

Deficiencies of vitamins B_1, B_2, and (very dubiously) A appear to have played their part in the ocular signs of beriberi.

We submit that bilateral optic nerve degeneration in beriberi is more common than the literature would indicate.

We think that the ocular signs of the disease do not of necessity include a contraction of the visual peripheral field, also that ocular paresis is uncommon.

We conclude that, as the optic nerve is part and parcel of the C.N.S., the damage done to the nerve proper by the axial optic neuritis of beriberi is final, and that any improvement of vision can be but slight.

Summary

Ocular signs in 30 recently rescued prisoners of war have been described.

Eight cases are discussed out of ten who showed evidence of: (*a*) bilateral retrobulbar neuritis; (*b*) no constriction of the peripheral visual field; (*c*) no ocular muscle paresis; (*d*) scotomata to a white target with a "tail" from the fixation point leading to the enlarged blind spot.

The relevant literature has been discussed. (Our main source of reference has been *Tropical Ophthalmology* (R. H. Elliott, Oxford Univ. Press, 1920). This contains many references to Japanese authorities.)

We would be extremely grateful for any information on beriberi cases with similar ocular signs from the wealth of clinical material that will shortly be available.

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[Scotoma charts were submitted with the MS of the paper, but it was found impossible to include them in the published account.]

PARACENTESIS AND MYRINGOTOMY: A QUESTION OF TERMINOLOGY

BY

T. B. JOBSON, M.D., B.Ch.

There are two minor operations on the ear which are quite distinct in technique but confused in nomenclature. One is the withdrawal of fluid from the middle ear by means of a hypodermic syringe and a 2-in. (5-cm.) hypodermic needle bent at an obtuse angle. This operation is not mentioned in any of the books on otology that I have seen. It is a valuable diagnostic procedure. In many cases I have been able to establish the fact that fluid was present and to identify the causal organism—always a single organism, whereas the pus from a discharging ear often yields several organisms. This drawing-off of fluid by a syringe from other parts of the body—for example, from an empyema—is termed paracentesis. Unfortunately, the term paracentesis is used in a large number of the books on otology to imply making an incision in the tympanic membrane for the purpose of drainage.

The derivation of these terms, myringotomy and paracentesis, is interesting and should help us to make a choice.

Myringotomy is a comparatively modern word. It was first used by Gruber[1] in 1863 and appears later in Ravogli's "La Miringotomia."[2] Mr. Rome, our helpful librarian at the Royal Society of Medicine, has kindly found these references for me. The actual articles are not in the library and can be found in this country only in the library of the Royal College of Surgeons, which is at present dispersed. The term myringotomy, although a hybrid, expresses accurately the operation of incising the tympanic membrane. It is derived from *myringa*, the membrane, a modern Latin word, and τεμνω, I cut, a Greek word.

MYRINGOTOMY

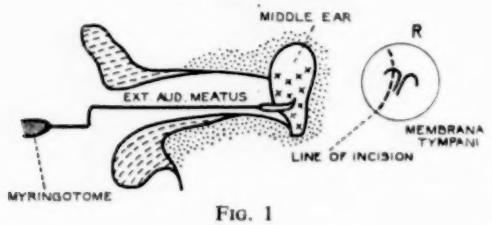

FIG. 1

When we come to paracentesis we are on more debatable ground. Paracentesis is a very old word, and was used by Galen, not as applied to the middle ear but in the sense of tapping for fluid in cysts, ascites, etc. It is interesting to read Galen's exact words on this subject. A friend (Mr. Burns) has kindly translated this extract for me.

"Tumours usually occur in the wrists and we remove them for the most part from women who are workers in wool; these also can be mollified by wax salve. Tumours and abscesses in the armpits we remove by cutting round them; similarly when they are found in the groin. In dealing with abscesses between the ribs, we make a distinction, and do not draw off all the matter altogether but little by little. . . . Sufferers from dropsy we tap slightly with an iron instrument shaped like a myrtle leaf, passing in from the left until it reaches the cavity."

FIG. 2.—A leaf of *Myrtus communis*.

Παρακεντησις means "poking through or across" and exactly expresses what Galen did. This is also what is done in drawing off fluid from the middle ear by means of a bent hypodermic needle attached to a syringe.

PARACENTESIS

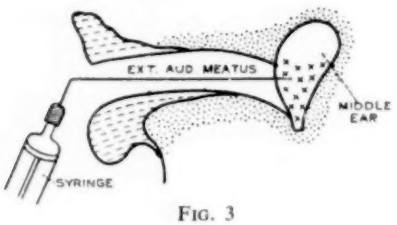

FIG. 3

I suggest that this operation should be known as paracentesis. True, it has not quite the Galenical meaning, but we need a word to denote the suction of fluid from the middle ear. It is incorrect to use this word to mean cutting the membrane.

[1] Gruber, I., "Die Myringodectomie als Heilmittel gegen Schwerhörigkeit und Ohrensausen," *Allg. Wien. Ztg.*, 1863, **8**, 305, 313, 321, 329, 338.
[2] Ravogli, A., "La Miringotomia," *Arch. di Med., Chir. ed. ig Roma*, 1875, **7**, 321.

A David Anderson-Berry silver-gilt medal, together with a sum of money amounting to about £100, will be awarded in 1947 by the Royal Society of Edinburgh to the person who, in the opinion of the council, has recently produced the best work on the therapeutic effect of *x* rays on human diseases. Applications for this prize are invited. They may be based on both published and unpublished work and should be accompanied by copies of relevant papers. Applications must be in the hands of the general secretary, Royal Society of Edinburgh, 22, George Street, Edinburgh 2, by Dec. 1, 1946.

DESIGN AND CRAFTSMANSHIP FOR THE TUBERCULOUS

A new attitude is coming over rehabilitation of tuberculous patients. No longer need one think exclusively of chicken farms, garden seats, leather bags, and the routine of factory life. The tuberculous subject has very often high mental endowment, and the field of art and creative design is one in which he can obtain constructive openings. The matter was discussed at a conference called by the National Association for the Prevention of Tuberculosis, and very largely attended by representatives of the medical profession, occupational therapists, and artists. It appears that there are at least 83 industries in this country where draughtsmen, craftsmen, designers, and workers in decorative and applied art are employed.

Commerce and Therapy

The DUCHESS OF PORTLAND, who took the chair, said that congenial employment was for tuberculous patients the breath of life. There was no reason why such patients should not produce first-class work of commercial value, and not merely something which depended for its sale on the charitable appeal of the sad label "Work by the Disabled." Sir WILLIAM CRAWFORD stressed the quality of British goods, but said they were not presented attractively enough and lacked colour, form, and design. Here was a field for the tuberculous patient—a field offering continual new interest which was beneficial to the patient, and one in which the work was both light and remunerative. Mr. PHILIP JAMES, director of the Council of Arts, said that people did not yet fully understand the healing powers of art. From the practical point of view there were two essentials: that instructors should be experts who encouraged creative design, not slavish copying, and that goods produced should be of commercial value and not "just Christmas presents." Mr. H. W. YOXALL emphasized the importance of good design, both for selling goods and for its therapeutic effect. The work taught should be work which would sell on its own merits and not on charitable appeal, and he advised concentration on industrial design for which there was an assured market, rather than on arts and crafts which called for specialized selling.

Dr. W. C. FOWLER, medical superintendent of Pinewood Sanatorium, thought from his own experience that about 10% of patients had clear potentialities, but that every tuberculous patient would benefit from the raising of the general standard of culture. He touched on the question of infection, and said that all articles made were easily and quickly disinfected. Many other points were raised in discussion. Dr. R. R. TRAIL, medical director of Papworth Village Settlement, pressed for two practical measures: the appointment of artists to teach people on an agreed scheme, and the obtaining of definite offers from commercial firms to consider the designs and work produced. These conclusions embodied the opinion of the meeting.

These general ideas have now to be translated into action, and the N.A.P.T. intends to make a practical scheme through which any tuberculous patient who needs help and coaching in exploiting his talent to the full in arts and crafts will not fail to get it.

MEDICAL LIBRARIES OF EUROPE

GIFT FOR A CENTRAL BUREAU

The Rockefeller Foundation has made an appropriation to the Royal Society of Medicine of a sum not exceeding £61,725, for capital expenditure and tapering maintenance over four years, to establish a Central Medical Library Bureau. The immediate function of this organization is to help in the rehabilitation of medical libraries on the Continent which have suffered through deprivation or devastation, and its long-term function the exchange of scientific medical information between individuals and institutions.

The method to be employed initially is the use of microfilm. A number of the best "microfilm readers" obtainable will be bought by the Society and lent to participating institutions. The scheme approved by the Rockefeller Foundation contemplates that while the work of rehabilitation is being carried on, interchange of information between medical libraries will be developed into a permanently functioning scheme which can continue to operate when rehabilitation is completed. Thus the more permanent function of the Central Medical Library will

be gradually established and the subscriptions of individuals and of associated libraries should enable the Royal Society of Medicine to continue the service without further help from the Rockefeller Foundation.

Preliminary work on details of this scheme is in active progress. A conference will be convened by the Society at an early date to which institutions concerned in its original scheme will be invited to send representatives in order that the new plan may be laid before them.

LONDON VOLUNTARY HOSPITALS

INCREASING PUBLIC SUPPORT

King Edward's Hospital Fund for London has performed another service by producing an elaborate analysis of the finance and work of 167 voluntary hospitals in London in 1944.[1] The financial tables show the impressive volume of public support which these hospitals continued to command even in the year when London was subject to flying bombs and other war distractions and when in consequence the hospitals themselves had fewer beds occupied and fewer people coming to the out-patient departments. The subscriptions and donations rose by £80,000 over the amount for the previous year and reached a figure of £1,144,000. Contributory schemes brought in a further £733,000, again a considerable increase, but patients' payments were, of course, down.

The amount derived by the voluntary hospitals from the public authorities worked out at just over 30% of their total maintenance income. This amount differs widely as between different classes of hospitals and as between different hospitals in the same class. For the twelve teaching hospitals the total sum received from public authorities was £725,429, being 32.9% of income, and in the larger general hospitals without medical schools the percentage was higher, and in some of the special hospitals—the chest hospitals, for example—it rose to more than half the income. The total sum received by all the hospitals from public sources was £1,803,000, an increase of £373,000 on the year, the increase being due to grants under the E.M.S. scheme and towards the increase in nurses' salaries. The public is generous to the voluntary hospitals, but, on at any rate a superficial reading of these figures, erratic in its preferences. The teaching hospitals receive only 15% of their income from subscriptions and donations, but the larger non-teaching hospitals receive a considerably larger proportion—possibly a reflection of local pride. Of the teaching hospitals the favoured one in 1944 was the Royal Free, which received 45% of its income in the form of voluntary gifts, whereas St. Bartholomew's received only 11%; but St. Bartholomew's has a far larger income from invested property than any other hospital.

The total bed complement of these 167 hospitals at the end of 1944 was 23,377, but the number of beds open to patients was 17,721, and the average number occupied daily during the year was 10,405. One perplexing feature at first sight is the great difference between the average periods of residence of patients in different hospitals, even hospitals of the same class. In the teaching hospitals the average period varies from 21.4 days at the London to 12.9 days at St. Bartholomew's. It is a little difficult to see why the average period of residence should be twice as long at the Metropolitan Hospital as at St. John's, Lewisham, or twice as long at Hendon as at Purley. Among the children's hospitals the average stay of patients at Queen Elizabeth's is 21 days and at Paddington Green 11 days. No doubt the position is influenced by the number of patients who stay, particularly at certain hospitals, for very short periods. For example, at St. Bartholomew's 1,488 patients were in the wards for three days or less, as compared with 564 at Middlesex and 587 at Westminster, each of the hospitals having about the same total number of in-patients. Other factors may be the ratio of medical to surgical beds in different hospitals and the existence of convalescent-home facilities.

[1] *Statistical Summary for the Year 1944.* King Edward's Hospital Fund for London, 10, Old Jewry, E.C.2. (1s.; or 1s. 6d. post free.)

CARE OF CHILDREN UNDER FIVE

Recognizing as an "unattainable ideal for the present" a situation in which mothers of children under 2 years of age will be discouraged from going out to work, the Ministers of Health and of Education have, in a recent circular, asked local authorities to make plans for adapting wartime nursing services to present needs and to submit these plans by the end of February. It is pointed out that for some time to come the need for women workers in certain vital industries may be as urgent as it was in wartime, and this, with housing and shopping difficulties, makes it necessary that provision for the day-time care of children up to the age of 5 should continue, including some for the "under 2's," who are not admitted to nursery schools and classes. The methods to be adopted will rest with the local authorities, but the circular suggests a combination of the following: nursery schools, nursery classes, day nurseries, and schemes of daily guardians; using maternity and child welfare centres on two or three afternoons a week as temporary crèches; organizing responsible women or older girls as volunteers to "sit in" at the homes of children while the parents go out together in the evening. Local authorities are asked to consider which wartime nurseries should continue to be run under maternity and child welfare powers; which should be taken over and run as nursery schools or nursery classes; and which should be closed. The cost of running wartime nurseries and wartime nursery classes will continue to be borne by the Exchequer until March 31. From that date such wartime nurseries as become nursery schools or nursery classes will attract the normal education grant from the Ministry of Education. Wartime nurseries continuing as day nurseries will receive a similar grant from the Ministry of Health. This grant will also be payable for registered daily guardian schemes, afternoon crèches, and evening "sitters in."

MEDICAL FOUNDATION OF EPSOM COLLEGE

In spite of a long list of pensions, annuities, and scholarships, totalling over £13,000, awarded during 1945 the Royal Medical Foundation of Epsom College has to announce that owing to lack of funds many deserving applicants—medical men and women, and children of school age—remain unassisted. There is a waiting list of 28 applicants for pensions and 24 for annuities. The object of this Foundation is to help the families of less fortunate colleagues, and that this aid is given far and wide is seen from the following list for 1945:

	£
50 ordinary pensions	1,500
41 Foundation scholarships for boys (educated, clothed, and maintained entirely free of cost)	6,309
13 scholarships for girls	570
15 exhibitions for boys	615
133 pensions and annuities of varying amounts	2,935
Grants towards education of 38 boys and girls	949
Grants to widows and spinsters	322

When it is realized, however, that to maintain this assistance the Foundation has to rely upon the generosity of subscribers for over £10,000 a year, then the need for more and larger subscriptions is only too apparent. An appeal is therefore made for all who can to help the Foundation in its work in 1946. Subscribers may, if they wish, ask for their contribution to go to some particular benefaction, and here it may be mentioned that the Sherman Bigg Fund enables the Foundation to make educational grants for those who cannot obtain scholarships. Subscriptions and donations for whatever aspect of the work may be sent to the Secretary, Epsom College, Surrey.

A POLICE EXHIBITION IN 1946

A Police Exhibition is to be held at Brighton from June 4 to 22, when the Chief Constables' (Cities and Boroughs of England and Wales) Association will hold its fiftieth conference. The Brighton Corporation is lending part of the Municipal Art Galleries and Museum for the exhibition. Its objects will be to create a wider public interest in the preventive and detective aspects of crime, and to draw attention to the advances made in forensic science. Certain scientific and criminal exhibits will be shown privately in the Royal Pavilion. Invitations will be extended to members of the legal, medical, and scientific professions, magistrates, and police to visit this.

The Home Secretary has shown his interest in the exhibition, and the Home Office is helping in the preparatory work. The Commissioner of Police of the Metropolis is lending exhibits from the Museum at New Scotland Yard, and chief constables and directors of Home Office Forensic Science Laboratories are contributing from their collections. Offers to lend documents, records, and exhibits of historical, legal, criminal, or scientific interest will be welcomed and correspondence should be addressed to the Chief Constable of Southampton, who is secretary to the committee.

Reports of Societies

DIET IN MENTAL ILLNESS

In the Section of Psychiatry of the Royal Society of Medicine on Dec. 11, with Dr. G. W. B. JAMES in the chair, there was a discussion on the importance of diet in mental illness.

Dr. W. REES THOMAS said that the point which had impressed him during his years in mental work had been the necessity for a varied diet. The history of dietetics in mental hospitals made sad reading. Twenty or thirty years ago little was known about diet, and the patients, though reasonably well fed, suffered from various dietetic deficiencies which he hoped did not exist to-day. In 1942 he undertook a special examination of a large number of patients in mental hospitals to discover whether there was evidence of vitamin deficiency; there was very little evidence of deficiency of vitamin C, and vitamin A was not shown to be deficient at all. The death rate in mental hospitals during the war was very much lower than during the war of 1914–18, when the increase of deaths in the mental hospital population became alarming; yet during the war just ended overcrowding had been greater, ventilation (owing to the black-out) had been poor, and shortage of nursing staff acute. From 1939 to 1941 the death rate rose gradually, but it began to fall in 1942, and by 1944 was at about the pre-war figure. In his view the difference in the position in the two wars was due to the recognition of the importance of diet. From a diet analysis carried out in 1942 it appeared that in two-thirds of the mental hospitals of this country the mean calorie value of the ordinary diet was 2,360 calories a day. Some 27% of the patients, owing to the circumstances of their work, received extra food, and 10% had extra food for other reasons. Such a calorie value was fairly good when it was remembered to what a large extent the population consisted of old people. The common complaint was lack of variety.

Mental Hospital Diet and the Rationing System

Dr. H. E. MAGEE said that the Special Diets Committee of the Medical Research Council, which advised whether patients suffering from any particular disease should have special allowances of rationed or other foods, had not recommended any priorities for mental patients, though such patients suffering from other complaints—e.g., diabetes or tuberculosis—were entitled to the prescribed allowances, and mental hospitals, like other institutions, could obtain a priority allowance of 2 lb. fish weekly for every patient requiring a light diet. The individual patient varied in his requirements according to the amount of muscular exercise he performed, from 3,500 calories a day for those who worked in the open air to 2,400 for those who did quiet and confined work indoors. Other things being equal, the needs of mental patients varied with their complaints. The melancholic or paranoic type might require only 2,000 calories a day, whereas the excitable type, with exaggerated reflexes, lack of co-ordination, continual unrest, and insomnia, might require 4,000 or more. Probably the need of the average adult male patient in a mental hospital was about 3,000 calories, and of the female 2,200. Could this be given under the present rationing system? If the diet included all the rationed and "points" foods, and if bread, potatoes, oatmeal, and fresh vegetables were given to satisfaction, there need be no fear of deficiency, whether in regard to energy value, proteins, minerals, or vitamins. In a diet of 3,000 calories, if a sensible choice were made of the "points," rationed foods would supply about 1,040 calories and 35 g. protein, mostly of animal origin. The remaining 2,000 calories would come from bread and flour (1,100), potatoes and oatmeal (220 each) and from such accessories as sausages, fish, and offal. These unrationed foods provided about twice as much protein as the rationed foods; it was true that it was mostly vegetable protein, but the evidence showed that enough proteins for the body's needs could be obtained from purely vegetable foods. It could not be said that the human body required animal protein as an indispensable part of diet after the stage of childhood had passed.

It was sometimes complained that people were not getting enough protein and that their diets were too starchy. But Dr. Magee argued that as a general rule it could be taken that if a person of ordinary tastes consumed sufficient calories from the food available he could scarcely avoid having enough protein, minerals, and vitamins. In fact the wartime food policy had been so planned as to make this possible. In conclusion Dr. Magee placed before the meeting the results of some observations made in 1942–3 in the male mental hospital of St. Anne in Paris by Randoin. Before the war the average calorie intake was about 2,877 daily, and the death rate 10%; in 1941–2 the average calorie intake was about 1,750 and the death rate 21%. On this level of diet the patients lost up to 5 kg. (11 lb.) in weight in six months, but when in 1943 the diet was increased all round by about 25% most of the losses in weight were restored in six months.

Prof. J. R. MARRACK emphasized the danger of a deficiency of vitamin B_1 if a return were made to the white loaf. He also asked whether there was any possibility that mental patients were more susceptible to vitamin deficiencies than other people. Dr. S. W. HARDWICK stated that he saw 12 cases of pellagra in a mental hospital in 1942. Dr. JOSIAH OLDFIELD said that dietaries should be built upon instinct and experience, not upon exact figures for calories. In mental hospitals the officers never ate with the patients and were unaware how much food was wasted. Wastage in cooking should also be investigated. To say that patients should be given 3,000 calories was valueless. Dr. R. STROM-OLSEN spoke of administrative difficulties in the distribution of food. In 1941 at his hospital there was an outbreak of what proved to be scurvy. It was cured by the administration of ascorbic acid, but it indicated that the overheating of food in hot containers in institutional feeding might give rise to vitamin deficiency. Dr. BENESH said that vitamin B deficiencies occurred in mental hospitals, but it was possible that the requirement of the mental patient for vitamin B was specially high. On the other hand, the food habits of the mental patient were often faulty.

The PRESIDENT said that the question of diet was a vital but much-neglected subject in hospitals. Food ought to be looked forward to by the patients, and, generally speaking, that was not the case. There was need for more collaboration with expert dietitians.

STRESS INCONTINENCE

At a meeting of the North of England Obstetrical and Gynaecological Society in Manchester on Nov. 16 Mr. P. MALPAS (Liverpool) read a paper on the cystometric and radiological aspects of stress incontinence.

The outstanding feature of the behaviour of the bladder was its complete and ready adaptation to all conditions of distension, artificial as well as natural, so that its resting pressure remained constant whatever its volume, except during a short refractory phase at the beginning of filling and just before the limit of complete distension. The resting pressure was quite low, but varied in different types of patient, and this variation might afford a method of measuring the essential vesical tone. Thus in early pregnancy the tone, as shown by a high resting pressure, was greater than in the non-pregnant woman. This would appear to be the cause of the frequency in early pregnancy rather than any mechanical factor, and also would appear to be a possible factor in the production of the hydro-ureter of pregnancy. In non-parous women the pressure was usually near to zero, never more than 10 cm. of water, and was no higher in patients with stress incontinence than in other women. This had some bearing on the operative treatment of stress incontinence. The strength of the repair required to produce continence need only be such as to withstand this low resting pressure, which was in no way comparable with the rise in pressure accompanying micturition.

It might be argued that in the various straining efforts which caused stress incontinence the bladder pressure rose to a much greater height, but the evidence did not support this view; even with a paroxysm of coughing it was impossible to build up the intravesical pressure to more than 15 cm. of water. A single cough produced a small rise, but if the cough were repeated quickly enough a summation effect of this degree might be produced. This observation confirmed the view that the mechanism to maintain continence need only be strong enough to withstand a low pressure. No relation existed

between the degree of distension of the bladder and the incidence of stress incontinence. The symptom was just as evident, sometimes more so, when the bladder was empty as at full distension, conforming with the clinical observation that the symptom was often quite troublesome soon after the bladder had been emptied voluntarily; in fact, owing to the pressure of the refractory phase at the beginning of distension it might be more so. As a minor way of combating the symptom he advised these patients to refrain from any sudden effort for a short period after micturition. In stress incontinence the control of micturition itself was normal and patients were able to stop the flow immediately they desired—an observation supporting the view that the lesion responsible for the stress incontinence was extrinsic to the bladder neck and the urethra. One group, in which the jet escaped under pressure, and a second and smaller group, in which the urine leaked on any sort of effort, not necessarily an effort raising the intra-abdominal pressure, might be distinguished by the fact that in the first group the ordinary methods of repair proved adequate; in the second group more specialized methods might be required.

A lateral cystogram gave much more information than an antero-posterior film, because the vesico-urethral junction was higher than the most dependent part of the bladder and could not be seen except in a lateral view. If changes in the contour of the bladder were to be seen, a weaker solution of sodium iodide than that usually employed was preferable; so the variations in the density of the shadow due to variations in the diameter of the bladder could then be picked out. In the descent of the bladder on straining, noted in cases of cystocele and stress incontinence, the bladder appeared to descend as a whole. The vesico-urethral junction was situated far more in the mid-pelvis than was commonly supposed; this had a bearing on the operative repair of these cases. It was important to avoid any operative procedure which would approximate the bladder neck to the back of the symphysis. In many cases in which a repair operation had failed to relieve stress incontinence it would be found that this had been done—the urethra and anterior vaginal walls were closely applied to the back of the symphysis and had lost their normal curve. The good results sometimes obtained by a Goebbel-Stoeckel-Aldridge fascial sling operation were probably due to the fact that the operation ensured an upward rather than a forward displacement, but with great care it was possible to achieve this end by means of the more conventional techniques.

Finally, Mr. Malpas showed a series of lateral radiographs taken during pregnancy and labour, mainly illustrating two points: the normal appearances and their variations from the non-pregnant condition, and the significance of an "abdominal" bladder during the first stage of labour. In most cases of trial labour in which an "abdominal" bladder could be seen during the first stage, the bladder shadow being completely above the pelvic brim, a Caesarean section would be necessary. In a normal labour the elevation of the bladder into the abdomen occurred quite late in the second stage, and even then was often incomplete in cases of easy labour. There was much to be said for combining the lateral radiograph with a lateral cystogram in the course of a trial labour.

Secondary Carcinoma of the Vulva

Prof. T. N. A. JEFFCOATE reported a case of carcinoma of the vulva secondary to a primary growth in the breast. The patient was a nulliparous widow, aged 65, first seen in Oct., 1944, complaining of a small swelling in the groin, which she had had for the past six months. This had given rise to an occasional pricking sensation on walking. A little haematuria had been noted two months previously for two days. A radical mastectomy had been performed eight years before for carcinoma. The site of the scar showed no sign of recurrence either in the skin or in the axilla.

On examination the patient looked well; she was thin but did not show any obvious signs of loss of weight. Just lateral to the left pubic spine was a shallow ulcer covering an area of about that of a sixpence, with a serpiginous outline. Its base was rather hard but freely mobile on deep structures, the edges slightly raised. It had the appearance of umbilication. There was no enlargement of the glands in the groin. Beneath the skin of the left labium majus and just anterior to the position of Bartholin's glands a nodule about the size of a pea could be felt. This was also mobile on deep structures, but was fixed to skin. The patient was admitted to hospital for investigations. The Wassermann was negative. A local excision was performed of the ulcer and nodule in view of the possibility of its being an intradermal carcinoma. Cystoscopy revealed an area on the right bladder wall the appearance of which was identical with that of the ulcer, about the same size and umbilicated. *X*-ray examination of the chest showed the right lower lobe to be collapsed. Histological examination revealed that both lesions were probably metastatic growths, the primary being the previous breast carcinoma.

No further treatment was possible and the patient was kept under observation. Death occurred in 1945. The post-mortem examination showed widespread small metastatic growths, all secondary to the old breast carcinoma; the distribution was bizarre in the extreme, and involved parietal and visceral peritoneum, stomach muscle, the pancreas, and even the appendix, both adrenals, the sternum, ribs, and vertebrae, both submaxillary glands, both ovaries, and the left Fallopian tube. It would seem that the secondaries appeared first in the mediastinal glands and were then disseminated in the blood stream. The extraordinary feature was that the vulva was chosen as the site of the first metastasis to attract attention, and that the patient's deterioration was so slow in view of the blood-borne spread.

Fatal Air Embolism in Pregnancy

Dr. C. H. WALSH read a paper on fatal air embolism following vaginal insufflation during pregnancy.

The patient, a primigravida aged 17, was being treated by picragol insufflations for leucorrhoea at about the thirtieth week of pregnancy. The first insufflation produced no discomfort, but the second, a week later, was followed by disaster. Insufflation was performed by a nurse with the patient lying in the left lateral position. Six or seven squeezes of the bulb were made. In a matter of seconds the patient became cyanosed, fought for breath, and became unconscious, dying in four or five minutes. Post-mortem examination revealed the uterus to be 30 to 31 weeks pregnant, and to contain a normally developed foetus. The placenta was situated in the posterior upper segment and showed a small detachment at its lower border and stripping of the membranes down to the cervix, with a minute trace of picragol powder in a maternal sinus. The inferior vena cava was ballooned with air and the right auricle markedly dilated and containing frothy blood. No other abnormality was discovered in any other structure in the body. The immediate cause of death was pulmonary artery obstruction and right-sided heart failure due to air embolism.

It was pointed out that the insufflator delivered about 50 c.cm. of air and powder, and in the average vagina, if the rubber cone made an airtight connexion with the introitus, six or seven squeezes would blow in some 350 c.cm. of air and powder, delivered at a pressure of at least 150 mm. Under these conditions, even a small patent venule was capable of gobbling up air with fatal consequences. Some very interesting radiographs of intravasation of lipiodol occurring in the course of tubal patency tests were shown. The conclusions were mainly that the forcing of air under pressure into any cavity in the body might cause sudden death from air embolism. Pregnancy or a bleeding surface favoured air entry. Therefore it was suggested that vaginal insufflation was contraindicated in pregnancy or in the presence of bleeding from the uterus, and that tubal insufflation should be discarded in favour of lipiodol technique.

*** Air embolism in pregnancy was the subject of a question and answer in the *Journal* of Dec. 1 (p. 793).

DUTCH PHARMACY UNDER THE NAZIS

Pharmaceutical conditions in Holland under the German occupation were reviewed in a lecture to members of the Pharmaceutical Society of Great Britain on Dec. 13 by Dr. C. J. BLOK, chief pharmacist to the University and Municipal Hospitals, Amsterdam.

About 1943, said Dr. Blok, many articles became so scarce that the General Office of Public Health found it necessary to limit the prescribing of the doctors. Cod-liver oil was only to be prescribed for tuberculosis; atropine only for Parkinsonism and as eyedrops; pilocarpine only for eyedrops; luminal only for epilepsy; pepsi for serious stomach cases; dermatol only for epilepsy. After t Germans had robbed the safe of the Organon factories insulin a

became very scarce. Dr. Blok went into considerable detail regarding the means taken to economize alkaloids for eye treatment, including the use of ointments instead of solutions. On top of all their troubles, he said, in September, 1944, came the loss of gas and electricity, which meant that sterilization in operating rooms by heat had to be reduced to a minimum as the spirit and petrol which might have been employed were very scarce. Fortunately he himself had steam autoclaves by which sterile injections could still be prepared. Operating rooms had to resort to chemical sterilization with 4% lysol, or a mixture of borax carbol-formalin with a little sodium nitrite against rusting. A very stable solution with quite effective sterilizing powers was 2% formalin, 2.5% phenol, 1.5% borax. Another difficulty was lack of gas for melting ampoule glass. They overcame that by rigging an ordinary bottle with a tube and separatory funnel and putting calcium carbide in it. The temperature obtained was enough to melt glass, and they used the apparatus at home as a lamp.

Correspondence

Tropical Medicine in the United Kingdom

SIR,—Dr. C. M. Wenyon, in his presidential address to the Royal Society of Tropical Medicine and Hygiene, reported in the *Journal* of Dec. 1 (p. 774), has called attention to the inadequacy of the facilities for the treatment of tropical diseases and for clinical research into them in London. He made it clear that, by comparison with the standards of other countries, they were inadequate before the war, and I am sure that your correspondents, Dr. A. R. D. Adams and others (Dec. 22, p. 895), will forgive me for saying that by those standards they were inadequate throughout the United Kingdom. By the fortunes of war they have been expanded in Liverpool and have deteriorated in London, but this is no reason why development should be restricted to London alone, though it is most pressingly needed there.

It should be made clear that the deterioration in London is solely one of clinical facilities as a result of the closure of the old Tropical Diseases Hospital, originally following the demand for evacuation of hospitals from London and later due to enemy action. The other activities of the London School have suffered no more curtailment than was necessitated by the departure of many of the staff to the Services, where they have practised their various specialties and gained fresh experience. Now they are returning there is in London a group of very active and experienced workers in tropical medicine and its associated subjects with reasonable facilities at their disposal, except for the lack of a permanent hospital. A temporary arrangement for access to cases for teaching purposes has been made by the courtesy of the Ministry of Pensions, but this cannot meet all the needs of London.

Before the war our chief competitor in the field of research in tropical medicine was Germany. This is no longer the case, but already the United States and Canada have greatly increased the number and quality of their research and teaching institutions so that the United Kingdom now suffers by comparison with them. Apart from the need to treat our own nationals suffering from tropical diseases, it is of great importance that we maintain a high standard of research and teaching, partly for the benefit of the Colonial Empire, and partly because it is very much to the material advantage of this country that people over-seas should look to it as a centre of learning. There is already a tendency for postgraduate students from the Dominions to prefer to go to the United States for advanced study of other branches of medicine, and with them they take very much more than their immediate student fees. This has not yet happened in the case of tropical medicine, but it will happen very soon if conditions do not improve in the United Kingdom.

Dr. Wenyon's proposals therefore merit serious and immediate consideration, but not necessarily acceptance in the exact form in which he puts them. They must be integrated with a scheme taking account of the needs of the entire country, as your recent correspondents suggest, and the proposal for the divorce of the London School of Tropical Medicine from the School of Hygiene, with which it is now incorporated as the London School of Hygiene and Tropical Medicine, must be subjected to constructive criticism. Further, they must be considered in relation to proposals for the establishment of over-sea laboratories in which workers from them could carry out work that cannot be done in this country.

Proposals of this nature were put forward about a year ago by Brig. Hamilton Fairley and received immediate influential support, but have been fruitless because the machinery to implement them was inadequate. Machinery is now required to prepare a general scheme to cover the needs of Britain and the Colonial Empire, as well as to prepare a detailed scheme for the re-establishment of London institutions to fit into it. There is no more representative body than the Royal Society of Tropical Medicine and Hygiene, and it is to be hoped that Dr. Wenyon's address will have this result. Any resulting scheme will need financial support, the justification for which must be recognized.—I am, etc.,

Ross Institute of Tropical Hygiene, London, W.C.1. G. MACDONALD.

Latent Disease in Far East P.O.W.s

SIR,—I read with considerable interest Dr. F. E. de W. Cayley's letter on this subject (Dec. 8, p. 822). One must assume that his warning is addressed mainly to those practitioners who sit on medical boards for the Ministry of Pensions, as he refers rather to the desirability of seeing that these returned P.O.W.s "have a square deal as regards financial compensation" than to the need for giving them appropriate treatment. The warning is perhaps not untimely, but there are several points in his letter that seem to me to be misleading, at least in implication.

1. The finding of *Entamoeba histolytica* in the stools of 13% of the men examined is not surprising in view of the fact that about 10% of presumably healthy persons in the United States are similarly infected, and that the figure for the United Kingdom is probably not much less, as shortly after the last war one of our leading protozoologists estimated that between 7 and 10% of the population in this country had *E. histolytica* cysts in their stools. In the absence of physical signs or other evidence of bowel ulceration or of hepatitis, the presence of *E. histolytica* does not constitute a pensionable disability, nor is it necessarily an indication for specific treatment. Conversely, the failure to find *E. histolytica* cysts in the stools does not exclude active amoebiasis even in the bowel, and certainly not in the liver, as in less than 50% of cases of amoebic liver abscess are cysts found in the stools.

2. The pathogenicity of trichomonas, provided it remains in the male intestinal tract, is very questionable.

3. Ankylostomiasis is easily cured and calls for treatment rather than a pension.

4. The statement that "chronic malaria seems to have responded in most cases to the six-weeks prophylactic course" is again very misleading. It is true that a six-weeks course of mepacrine will cure malignant tertian (*Plasmodium falciparum*) malaria, but the troublesome relapsing benign tertian (*P. vivax*), to which Dr. Cayley is presumably referring when he writes "chronic malaria," is emphatically not likely to be cured by a six-weeks, or even a six-months, prophylactic course of mepacrine. Such a course will protect the individual from a clinical attack of malaria only so long as he is taking the drug and for a week or so afterwards while the mepacrine blood concentration remains above the suppressive level (about 12 μg. per litre), but after this the patient is liable at any time within a year or even longer to suffer a clinical attack of malaria.

Prolonging the course of mepacrine only postpones the evil day when relapses have to be faced. From the point of view of the Army, it is no doubt good policy to give this six-weeks course of mepacrine to the home-coming P.O.W., as it keeps the man free from malaria as long as he is in uniform, but, from the point of view both of the individual and of the pension authorities, it is not nearly so good; for, on the one hand, the man's first post-war job may be repeatedly interrupted by bouts of malaria and, on the other, as his future malaria relapses are unpredictable the pensions authorities are presented with a very difficult problem in assessment. It would be far more satisfactory if after the last possible exposure to infection the

prophylactic mepacrine were to be given for not more than two weeks (which would allow for the eradication of the more dangerous malignant tertian infection if he happened to have it). Any suppressed benign tertian infection that he had would then be unmasked, he could receive treatment for the early relapses while still in the Army, and meanwhile some indication —by the lengthening of the interval between the relapses, for example—may have been given as to what will be the future course of his infection. This will allow the man to arrange his life accordingly and help the Ministry of Pensions to compensate him more suitably.—I am, etc.,

Silchester. L. EVERARD NAPIER.

Toxicity of D.D.T. to Man

SIR,—In a medical memorandum entitled "A Case of D.D.T. Poisoning in Man" in the *Journal* of April 14, 1945 (p. 517), Dr. V. B. Wigglesworth records the case history of a laboratory worker who exposed his hands to D.D.T. in acetone solution. This case was of particular interest here as certain aspects of D.D.T. toxicity to human beings were being investigated at that time. The conditions of exposure were imitated by volunteers, though the duration and frequency of the exposures used here were probably greater than those of Wigglesworth's case.

The exposures were made in two parts: first, repeated minor exposures, and, secondly, more complete exposures by kneading. In the minor exposures 5 c.cm. of 20% commercial D.D.T. (59% p.p. isomer) solution in acetone was poured over the back of each hand, allowed to evaporate, and the residual deposit swabbed off with cotton-wool soaked in acetone and the application then repeated. Five applications were made each morning and each afternoon for two days, the last deposit being left on until the hands were washed for taking meals. Thus the total amount of D.D.T. so applied was 40 g. and the hands were covered with D.D.T. deposit for about 10 hours in all. In the more complete exposures, begun 3 days later, 25 g. D.D.T. dissolved in 200 c.cm. acetone was added to 400 g. soap-stone or French chalk and the mixture kneaded with the hands for 15 minutes, adding more acetone as required. During this operation the mixture completely covered the hands almost to the wrists. When the hands were taken from the mixture the solvent rapidly evaporated, leaving a dry deposit on the skin, which was removed as before by swabbing with acetone. Finally another kneading exposure lasting 30 minutes was carried out 1 to 2 weeks later. Three volunteers did the entire experiment, and a further three did the kneading exposures only. None of the volunteers suffered any irritant or toxic effects at all.

In Wigglesworth's case symptoms commenced one to ten days after exposure; the patient developed a feeling of heaviness and aching in all the limbs and weakness of the legs, and "spasms of extreme nervous tension. There was some improvement during a holiday taken at this time; but on returning to work the condition deteriorated, and some three weeks later the perpetual aching in the limbs confined the patient to bed. Sleep became almost impossible; the feeling of extreme nervous tension became more frequent, and a state of acute mental anxiety developed. About six days after being confined to bed involuntary muscular tremors occurred over the whole body, and these were experienced on at least two subsequent occasions. After 10 to 14 days the patient got up, although the aching in the limbs was still severe. His recovery was very slow. He was away from work for 10 weeks in all, but even at the end of a year recovery was not quite complete."

In view of the negative results obtained here and of the fact that many symptoms but no signs apart from muscular tremors developed in Wigglesworth's case, it seems possible that the patient was suffering from an anxiety state and that D.D.T. in acetone is not a particularly toxic preparation. It may be added that many other experiments in which moderate quantities of other preparations of D.D.T. have been applied to the skin have failed to produce toxic signs or symptoms, although in some cases irritancy due to the vehicle has occurred.—I am, etc.,

Chemical Defence Research Establishment, Cannanore, S. India. W. G. DANGERFIELD, Capt., R.A.M.C.

*** An investigation into the toxic effects of a distemper containing D.D.T. and a fatal case of D.D.T. poisoning are described in the *Journal* of Dec. 15 (pp. 842, 845).—ED., *B.M.J.*

Acute Yellow Atrophy after Trilene

SIR,—In his letter (Dec. 1, p. 784) regarding Major K. N. Herdman's case of acute yellow atrophy, Dr. Philip Ayre states that the short-acting barbiturates are almost entirely detoxicated in the liver, quoting Dr. Langton Hewer's reference to the work of Reynolds (1938) *et al.* and the general assumption regarding their fate arising from Tatum (1939) and Goodman and Gilman (1940). Hale (1935) and Marshall (1939) have also attributed detoxication to the liver, but Cameron and de Saram (1939), Scheifley and Higgins (1940), and Kohn-Richards and Grimes (1939) were unable to confirm this, though Kohn-Richards and Grimes definitely showed that detoxication does take place in the body. Masson and Beland (1945) suggest that the barbiturates can be divided into four groups according to their site of inactivation or excretion, and these workers attribute detoxication of pentothal to the body tissues generally and not to any great extent to the liver and kidneys. Evipan, however, falls into the group mainly inactivated by the liver.

Whatever value may be placed on experimental work, the actual fate of various barbiturates in the human body remains for the most part unproven, and accordingly the anaesthetist must still proceed with blind caution; but it seems probable that fallacies will arise from attempts to draw conclusions about the barbiturates generally from work upon isolated members of the group. All too often experimental work has little relation to the procedure and dosage of clinical anaesthesia, as is instanced by Beecher's (1938) statement on the similarity of the gross effects of chloroform and ether—effects which we do not promote with the latter agent because we do not employ ether in sufficiently high concentrations.

Lundy and Adams (1940) and Masson and Beland (1945) state that from clinical experience they have found little contra-indication to the use of pentothal in liver and kidney disease, though Argy *et al.* (1936), Goodman and Gilman (1940), and Kohn-Richards and Appel (1941) have all shown that where the liver or kidney is the organ mainly responsible for inactivation or excretion, sensitivity to the barbiturates is greatly increased. Using routine hospital investigations, I have been unable to prove any impairment of the liver or kidney functions on a few patients found to be hypersensitive to pentothal; and, though admittedly the dosage of pentothal administered to patients with active liver disease has been very low, none has shown an indication of hypersensitivity.

So far as the cause of acute yellow atrophy, the subject of the original letter, is concerned, I should like to associate myself with Dr. Clifford Wilson's theory (Dec. 1, p. 784).—I am, etc.,

Worcester. E. F. GLEADOW.

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Renal Failure and Anoxia

SIR,—In a recent article Maegraith *et al.* (1945) proposed that the title "renal anoxia" be applied to the renal failure occuring in a variety of conditions "generally secondary to acute peripheral circulatory failure." As my name (Tomb, 1942a) has been prominently and inaccurately identified by the authors with the proposed title, I shall be much obliged if I may be permitted to make some observations concerning it.

In 1941 (a) I first put forward the suggestion that the anuria of cholera is due to anoxia in these words:

"The frequent failure of intravenous saline injections to restore and maintain the circulation in cholera, as well as to re-establish the secretion of urine after collapse has existed for two or more hours, is thus seen to be due to irreparable damage to the capillary

endothelium, as well as to the epithelial cells of the kidney tubules, from lack of oxygen."

In the same year (1941b) and also in 1942 (a) I gave reasons for believing that the anuria of "crush injury" is, like the anuria of cholera, due to anoxia.

In the first of these two articles I wrote:

"It would therefore appear that, in so-called 'crush injury,' the renal failure and associated histological changes in the tubules are caused solely by oxygen want (as suggested by Sir L. Hill), the epithelial cells of the convoluted tubules being even more sensitive to want of oxygen than the endothelium of the blood capillaries itself."

In 1942 (b and c) I gave a detailed analysis of the causes of anoxia and suggested that the anuria found in blackwater fever, incompatible blood transfusion, and pernicious anaemia, as well as in cholera and "crush injury," is due to anoxia.

In 1943 these various communications were finally summarized by me in an article in which I concluded that "the anuria and renal changes met with in crush injury are manifestations of anoxia due to traumatic shock, and are identical in origin with those found in acute haemolyses—e.g., incompatible blood transfusion and blackwater fever; in pernicious anaemia, severe haemorrhage, and the collapse of cholera, all of which are due to anoxia."

With regard to incompatible blood transfusion, it would appear that the renal syndrome found in this condition is not ordinarily due to the anoxia caused by haemolysis of the recipient cells, but to anoxia caused by collapse (Foy *et al.*, 1943), or by the antecedent conditions necessitating transfusion (haemorrhage, anaemia, etc.).

In the 1943 (4th) editions of the textbooks of pathology by Beatty and Dixon and by Boyd the importance of anoxia is stressed as a cause of fatty degeneration, particularly of the secretory cells of the kidney and liver. Of anoxia Boyd (1943) writes as follows: "There are two great causes of fatty degeneration: (1) the action of toxins and (2) the lack of oxygen. It is possible that the first acts by virtue of interfering with the proper oxygenation of cells. . . . Insufficient oxygenation . . . is seen in severe anaemias both primary and secondary." Beatty and Dixon also write to the same effect.

Anuria may be caused, apart from obstructions to the urinary tract, (1) by a fall in arterial blood pressure (Winton, 1937) and (2) by damage to the secretory epithelial cells of the renal convoluted tubles from (*a*) anoxia and (*b*) inorganic or organic poisons, including bacterial and viral toxins (Leftwich, 1920; Moon, 1944). Since circulatory failure is only one of the many causes of anoxia (Tomb, 1942b, 1942c) and anoxia is only one cause of renal tubular degeneration and failure (Boyd, 1943; Beatty and Dixon, 1943) it is not possible accurately to attribute to anoxia, whether or not due to circulatory failure, the renal syndrome common to the varied conditions enumerated by Maegraith and his associates in their article.—I am, etc.,

Sydney, N.S.W. J. WALKER TOMB.

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Keratoconjunctivitis

SIR,—The paper by Major R. J. Buxton on keratoconjunctivitis (Dec. 15, p. 847) is of considerable interest. Lesions covered by this general term differ widely in aetiology, and it is therefore important to define the description "keratoconjunctivitis" more precisely. For example, superficial punctate keratitis (Fuchs's) is a well-established entity occurring sporadically; during the past 15 years an epidemic form has been recognized with involvement of the conjunctiva, cornea, pre-auricular gland, and with ptosis; and there is satisfactory evidence that the infection is due to a virus. For these reasons the term "virus keratoconjunctivitis" or "epidemic virus keratoconjunctivitis" has been evolved and is coming into general use. We are not clear if the author is using the term "keratoconjunctivitis" in this sense for some of his cases. In epidemic virus keratoconjunctivitis the corneal opacities are frequently varied in size and distribution, and it is by no means uncommon to find them mainly in the periphery of the cornea as in the cases described by Buxton. The discrimination is an important one, as the search for focal sepsis has little part in the treatment of epidemic virus keratoconjunctivitis, which in the great majority of cases is a self-limiting disease.—We are, etc.,

The University, Glasgow. W. J. B. RIDDELL.
I. C. MICHAELSON.

Operation for Varicose Veins

SIR,—Dr. R. R. Foote (Nov. 3, p. 627) raises the question of the use of sclerosing solutions at the time of the ligature of the varicose veins. It would appear that to omit a sclerosant at the operation is to go back to twenty-five years ago and to disregard a generation of experience in injections of varicose veins. Surely the ideal time to use a sclerosant is when the vein is empty and without circulation. In my hands the combined operation yields consistently good results. Admittedly, it does not sclerose all the varicosities, but certainly the main trunks and their large adjacent branches are rendered solid before the patient leaves the table.

I would stipulate two points about a sclerosing agent. The first is that it must be harmless when injected into the systemic circulation. Saturated solutions of common salt or of glucose fulfil this condition. Other agents—such as ethamolin, sodium morrhuate, sodium salicylate, quinine, lithium salicylate—are capable of lethal effects, and for this reason I have abandoned them at the operation of ligature and injection. Secondly, the sclerosing agent, the syringe and needle must be sterile; this is an obvious point, but it is often neglected and deaths have occurred from septicaemia. Syringes are often "sterilized" in spirit and the sclerosing solution handled in such a way as to contaminate it. Varicose veins are large conduits connected with the main systemic circulation, and any infection introduced into them is quickly distributed. Therefore the technique must be beyond reproach. Because the number of vein patients is large we must organize and train teams to handle them, rather than offer mass-production operations of inferior quality. Already Continental surgeons have visited Britain for information on this ubiquitous condition, and we must give them a sound lead.—I am, etc.,

London, W.1. HAROLD DODD.

SIR,—Since this disease is under discussion again perhaps I might be permitted to give the details of the technique I have found most satisfactory in many hundreds of Service and civilian patients, both male and female, during the past six years.

My patients are always admitted to hospital for a week at least to ensure satisfactory pre-operative preparation and post-operative care. They are always operated on in the main theatre, with most careful aseptic precautions before, during, and after operation, since one is operating in a potentially infected area—the groin. I have never had any delay in the healing of wounds as experienced by some surgeons, and I feel sure this delay in healing must be due to lack of proper asepsis and haemostasis or to escape of sclerosing fluid into the wound (Dr. L. F. Muldavin, Dec. 8, p. 816). As for all other planned operations, I always have the first "skin prep." done the day before operation. The points of technique are as follows:

1. The patient lies supine on the operating table, which is then tilted head down so as to empty the dilated veins as much as possible. We desire to produce an aseptic phlebitis in the injected veins, not a bulky thrombophlebitis.

2. Local analgesia is usually employed, unless the patient desires general anaesthesia, premedication being with omnopon and scopolamine in either case.

3. An oblique incision is made in the skin creases across the saphenous opening, and the upper end of the long saphenous vein is displayed. All the tributaries are isolated, both at the saphenous

opening and along the proximal 2 inches (5 cm.) of the main trunk, being then ligated and divided.

4. The long saphenous vein is doubly ligated flush with the femoral vein then divided beyond the ligatures.

5. As ligation alone will not lead to efficient and firm obliteration of the dilated vessel and tributaries in the leg, the distal end is injected with sclerosing fluid through a ureteric catheter passed down inside it as far as possible, sometimes to the medial malleolus. Sodium morrhuate (4 c.cm. of 4%) has been found quite satisfactory. The lower end is then doubly ligated to prevent leakage back of sclerosing fluid into the wound.

6. The wound is closed after checking haemostasis and swabbing it out with diflavin, a deep catgut (00) continuous stitch being used for the fascia and interrupted vertical mattress sutures of nylon or fishing gut for the skin. These latter are placed close together to ensure careful sealing of the wound against infection or contamination from outside later on.

7. As soon as possible after injection of the saphenous vein crêpe bandages are applied firmly from toes to groin, to prevent filling with blood and dilution of the sclerosing fluid. The dilated veins are far less likely to become recanalized if converted into flat ribbons instead of ugly lumpy masses of clot. I feel this early bandaging to be most important, but I have never seen it referred to by other surgeons.

8. A dressing is applied to the wound, fixed with "elastoplast."

9. The patient is encouraged to walk about the same day and get up quite normally each day afterwards.

10. Further injections are made into any veins in the leg not blocked by the original injection. This is begun about a week or so after operation, and into veins emptied of blood so far as possible by elevation of the leg. The bandages are reapplied and worn until no swelling occurs at ankle or on dorsum of foot with normal activity, usually in two to three weeks. I have had no cases of swelling lasting longer than that.

As Major-Gen. W. H. Ogilvie stated (May 5, p. 619): "The only successful treatment for true varicose veins which are causing symptoms is Trendelenburg's operation, properly done." He condemns injection alone because it is not dealing with the cause—i.e., back-pressure from the femoral vein above, due to incompetence of the valves in the long saphenous trunk and its tributaries. This is a *sine qua non* and vitiates the necessity for Trendelenburg's test, or the application of a series of tourniquets (Dr. Muldavin, Dec. 8, p. 816). It also emphasizes the need to divide and ligate the tributaries at and below the saphenous opening. Injection of any dilated and still present calf veins should always succeed then, provided the injection be made into a vein emptied of blood by elevation of the leg and supported later by firm bandaging. If the patient is encouraged to walk about as soon as the bandage is applied following injection, any sclerosing fluid entering the deep veins is soon diluted and swept away without causing damage. I have not had any evidence of such damage occurring in any of my patients.

Surgical excision of calf veins would produce unjustifiable and unsightly disfigurement in a woman, and I have never found it to be necessary even in "Commandos." I can hardly imagine any operative procedure more likely to cause damage to the remaining superficial and communicating veins, with risks of subsequent haemorrhage, sepsis, or permanent venous insufficiency, than the old operation of avulsion of lengths of varicose veins. I have just operated on a woman who had thirteen incisions made over both her legs and thighs for such a barbarous procedure some fifteen years ago, followed by injection of recurrent dilated veins five years ago. She had not had a Trendelenburg operation done, so that her original condition could hardly have been worse than the hideous deformity of her recent recurrent state.

I have not found it necessary to ligate the long saphenous vein at the medial malleolus (Mr. Harold Dodd, June 2, p. 780), nor can I understand the rationale of this procedure, since the venous pressure is from above and not below the malleolus; unless, of course, it is to support the weight of the relatively huge volume of sclerosing fluid he uses. I feel it is safer to take "two bites at the cherry," and inject only 3 to 4 c.cm. of sodium morrhuate at a time, with less risk of its escaping into the deep veins and no risk of the "bursting effect from below" on the upper ligatures. I have never found ligation of the long saphenous vein or its tributaries in the leg necessary, but the short saphenous vein may need to be divided and ligated in the popliteal space. The reported fatalities have been mostly, if not all, from pulmonary embolism, due to failure to ligate the saphenous trunk flush with the femoral vein.

I agree with Mr. Dodd that most meticulous attention must be paid to detail in performing these operative procedures, which should not be left to the inexperienced H.S. alone. Dr. R. R. Foote (Nov. 3, p. 627) refers to some of the mishaps that might occur. But I cannot agree with him that "economic conditions or shortage of beds" should persuade us to treat these people as out-patients. By keeping them in hospital for at least a week one can observe the immediate result and/or reaction following the ligation and injection operation. Surely it is better to do less work to the best of our ability than more in a slipshod manner. Some people have quite severe and unpredictable reactions from sodium morrhuate injection, even with high pyrexia and rigors. I feel it is safer to have such people in hospital under careful observation.

With reference to the treatment of varicose ulcers (Dr. R. K. Brooks, Dec. 8, p. 816), I have invariably found that dealing with the cause—the varicose veins—is the quickest and most certain way of getting these ulcers to heal. Surely improving the circulation in and around the ulcerated area is far more important than what is applied to the ulcerated surface. "Elastoplast" strapping, Unna's paste, or "viscopaste" bandages all seem equally efficient in aiding healing, provided the cause is dealt with first. Some people cannot tolerate "elastoplast." I know of only one patient whose ulcer obstinately refused to heal after dealing with her varicose veins, and it had to be excised.—I am, etc.,

Mount Vernon Hospital, Northwood. ALAN SHORTER.

Cardiac Massage

SIR,—Being in a position to record three consecutive recoveries from impending death under anaesthesia goads me into simplifying a plan of action for use in case of cardiac arrest. I have been able to satisfy myself that the early anxieties and later complications that follow temporary cardiac cessation are directly proportional to the length of time the organ is functionless—an observation in keeping with rudimentary physiological principles and common sense. I can go so far as to say that now that prophylactic chemotherapy is available, should the time the heart is allowed to stand still be less than 1½ minutes it is improbable that the patient will suffer harm or even any inconvenience over and above that occasioned by an upper abdominal incision.

The anaesthetist reports that he cannot feel the pulse. When the surgeon has access to a large artery—e.g., the abdominal aorta; the common iliac—he can himself confirm that the heart has ceased to beat. When a large artery is not available the surgeon must wait not more than three-quarters of a minute while the anaesthetist verifies that the patient has an unobstructed airway, after which the anaesthetist gives the final, vital verdict. While the fleeting seconds are passing the surgeon is not idle: he and the theatre sister are sterilizing the epigastric area and arranging towels suitably. At the given word, with a sweep of the knife the upper abdomen is entered in the middle line immediately beneath the xiphisternum. The heart is massaged beneath the diaphragm, with counter-pressure exerted by the left hand on the lower thorax. Directly the welcome response is assured, sulphanilamide powder is poured into the wound, which is closed rapidly. As soon as convenient the blood pressure is taken; if it is under 100 mm. Hg, plasma infusion is started and methedrine administered. Prophylactic penicillin therapy is commenced in the early post-operative period. The whole point of this communication is that I want to make it perfectly clear that I have abandoned expending time in performing artificial respiration and injecting adrenaline into the ventricle.

I would also like to emphasize that experience has taught me that cardiac arrest can occur in any patient, with any anaesthetic agent, and with any anaesthetist. To those who question this statement (and the correspondence columns of the *Journal* show that there are many) I suggest that if the coroner for the district be consulted it is probable that "he who thinketh he standeth will take heed lest he fall from unpreparedness."—I am, etc.,

London, W.1. HAMILTON BAILEY.

Non-specific Mesenteric Lymphadenitis

SIR,—With reference to Mr. Ian Aird's instructive article on acute non-specific mesenteric adenitis (Nov. 17, p. 680), I should like to record two interesting cases treated in this hospital during the past six months.

Case 1.—A boy of 13, sent in as a case of perforated appendix, complained of nausea for four days but no vomiting, diarrhoea one day, and acute lower abdominal pain starting early on the day of admission. No previous attacks. On examination he was obviously ill, temperature 100.6°, pulse 112, tongue moderately furred. Abdomen tender all over and rigid in the lower half; the tenderness was most marked to the left and slightly below the umbilicus, and beneath the rigidity an indefinite mass could be made out at this point. P.R. there was a bogginess, but no definite pelvic swelling, and no tenderness.

With a provisional diagnosis of peritonitis due to an inflamed Meckel's diverticulum, or perhaps the rare left-sided appendix, he was opened through a paramedian incision. There was a large quantity of frankly purulent fluid in the peritoneal cavity, and the whole of the mesentery of the small intestine was studded with large fleshy glands. They were soft with no evidence of caseation, and varied in size from 1/2 to 2 in. (1.25 to 5 cm.), the majority being about 1 in. (2.5 cm.) in diameter. The largest was at least 2 in. in diameter, and was acutely inflamed, red, and fluctuant, and had become firmly adherent to the upper part of the descending colon, with which it had formed a faecal fistula. No primary cause was found for these enlarged glands. The appendix was normal, as also was the whole of the bowel wall. A temporary transverse colostomy was performed proximal to the faecal fistula, and the pelvis drained through a separate stab incision; 10 g. sulphanilamide powder was sprinkled into the peritoneum, and the wound closed. The appendix was not removed. After a rough passage for the first two or three days he began to improve, and the colostomy was closed a fortnight later, after which he made an uninterrupted recovery.

The pathological report on a typical medium-sized gland removed at operation for biopsy was as follows: "Great endothelial hyperplasia with polymorph infiltration. Acute sinus catarrh."

Case 2.—A man of 62, admitted as a case of subacute intestinal obstruction, complaining of central abdominal pain for 3 days and vomiting for 2 days. Bowels constipated. He had had several previous attacks of less severity. On examination he appeared comfortable, temperature 97.6°, pulse 76. Apart from some very mild lower abdominal tenderness there was nothing abnormal to be found. An enema gave him relief and he slept fairly well through the night. Next day he said the pains were getting worse, and his temperature had risen to 99.4°. The abdominal tenderness was more marked, but was not localized, and there was no rigidity.

With the diagnosis still very much in doubt he was opened through a paramedian incision. There was a localized pelvic peritonitis present, caused by the rupture of a small mesenteric gland. The mesentery of the small intestine contained a considerable number of small fleshy glands, about the size of a pea. One of these, about 1 in. (2.5 cm.) from the bowel and 6 in. (15 cm.) from the ileo-caecal junction, had become completely necrotic and had ruptured, causing the peritonitis, and leaving a hole filled with slough. There was no evidence of diverticulitis, and the wall of the small intestine was normal. The appendix was also normal but was removed. Sulphanilamide powder was sprinkled into the peritoneum and the pelvis drained. Convalescence was protracted by the development of a subphrenic abscess which had to be drained, but he eventually made a complete recovery.

These two cases are recorded as examples of the more serious complications of acute non-specific mesenteric adenitis. Many have probably had similar cases, but they are seldom mentioned in the textbooks.

I should like to thank Dr. W. Briggs and Mr. Pearce for permission to publish these cases.—I am, etc.,

JANET W. BEDFORD,
Resident Surgical Officer.
Blackburn and East Lancs Royal Infirmary.

Epidemic Diarrhoea and Vomiting

SIR,—Your issues of Oct. 20 (p. 524) and of Nov. 10 (p. 666) and others lead me to report on my experiences on the above subject. In the last eight years there have been recurrent outbreaks of this complaint in this district, and I crave permission to offer my explanations.

(1) Like the other observers, I have found that repeated examinations of stools have produced no organisms which stand out as being chief offenders. This, then, makes me think a virus is responsible.

(2) This virus does not act by itself, but by a process of symbiosis—i.e., in combination with other commensals of the bowel, both being necessary to produce the symptoms. In this way one can attempt to explain why certain members of the household escape and why the complaint "shows up" in isolated places miles apart.

(3) There is a seasonal incidence, for it has been my observation that the malady prevails in very wet weather. Such weather produces a richer type of grass, which is fuller of sap. This has an effect on the quality of milk, for I am of the opinion that milk is the vehicle through which the germ is carried; and cows' milk is not the only vehicle, for I have known at least two cases in which breast-fed babies have had the complaint while the mothers were victims.

(4) Finally, I have observed on more than one occasion that 48 hours or so after an attack of vomiting, diarrhoea, and abdominal pain, jaundice appeared, and in epidemic form. I offer the suggestion as well, that there is some connexion between this (fortunately) generally mild complaint and the so-called more serious summer diarrhoea of children.—I am, etc.,

ROSS. K. BROOKS.
Chipping Sodbury.

Domiciliary Midwifery and the Family Doctor

SIR,—It is unfortunate that owing to the time taken by ocean mails in these days the subject of this letter may well be a "dead bird" by the time it reaches you. The letters in the *Journal* during last September on doctors and domiciliary midwifery have interested me, and I felt that I would like to point out that there is not necessarily any conflict between the two views. It is only when one is bound to things as they are that there appears to be any. I may say that I am no stranger to English ways, having learned my midwifery in the neighbourhood of Camden Town and Somers Town.

I would like to illustrate what I mean by giving you a short description of midwifery as it is carried out in a country town in Australia, which does not differ in any essential from other country towns except that it has achieved a concentration of its hospital resources. The town and district comprise about 15,000 people and are served by six general practitioners. There is only one hospital in the town, a 100-bed community hospital. Its maternity section is a unit capable of taking up to 25 patients in single-room, double-room, and ward accommodation. Some 300 to 400 maternity cases are attended in the unit each year by the six doctors, no resident being employed. This is surely ordinary enough for anyone. The points bearing on the argument of private practitioner *versus* hospital for midwifery are these:

1. The doctors have been so convinced of the superiority of proper hospital accommodation for delivery that for years they have refused to attend any confinements except in the hospital.

2. The patients have become equally convinced. Some 15 years ago there were five posts at distances of from twenty to fifty miles (30 to 80 km.) from the town staffed by certificated midwives under the Bush Nursing Association. Four of the five have closed down for lack of support. In the fifth the nurse does no confinements, the patients coming fifty miles to this town for hospital conditions.

3. Practically all pregnant women consult their own doctors in the early stages of their pregnancy, and attend them regularly for ante-natal care at their own professional rooms (which in this town are all under the hospital roof).

4. All women in labour and during the puerperium are attended by their own doctors with the assistance of the trained nursing staff of the hospital.

5. In any emergency the full resources of a properly equipped hospital are at the disposal of the patient.

6. All babies, including premature ones, are nursed in the unit nursery in suitable conditions, including a separate room if necessary; and after leaving the hospital they are cared for by the Baby Health Centre sister, who makes contact with the mothers while they are in hospital.

7. The seven double-certificated sisters on the unit staff are able to give a better service to all mothers than would double their number if they were scattered round the district on a domiciliary service.

8. All morbidity is known, checked, watched, and discussed, and check swabbing of throats and bacteriological examination of hands can be carried out at need.

9. Proper records of all work done can be kept on a truly comparable basis, and this has proved of great value in the past.

10. A full clinical survey of ten years' work in this unit has been drawn up. It shows that the results in all respects are of good standard in comparison with the main teaching hospitals of the State.

The arrangement is simple and effective. It involves no departure from established principles. It is a true fusion of the functions of the family doctor and the maternity hospital. It requires no more than the provision of the necessary accommodation and staff, together with the putting into effect of the principle that doctor and hospital are properly one unit and not to be dissociated from one another.—I am, etc.,

Colac, Victoria. ARTHUR E. BROWN.

Spinal Analgesia in Operative Obstetrics

SIR,—As regards spinal analgesia and the correspondence of the last few weeks on this subject, I would like to say that I have had the utmost satisfaction in the use of light percaine and nupercaine given by the Etherington Wilson technique. It is agreed, I think, that the utmost attention to detail is necessary for success with spinal analgesia, not only in the technique of administration but also in the giving of ephedrine, the greatest gentleness in handling the patient, and keeping the head low for 24 to 48 hours—the longer the better—to avoid headache.

I have used the heavy percaine on only a few occasions, and in two comparatively minor operations in men—circumcision and anal abscess—headache followed. I therefore never use it now, and I would suggest that Dr. Louis Resnick (Nov. 24, p. 722) would do better to use the light percaine: with the rest of his article I am in complete agreement. The beautiful relaxation which one gets in all lower abdominal work under spinal analgesia more than counterbalances any disadvantages.

In the same issue (p. 719) Mr. Alexander Lyall reviews 480 cases of appendicitis, and, in discussing the anaesthetic used, there is not even mention of spinal. I would say that one should ask oneself, in every case of appendicitis, Are there any reasons why a spinal analgesic should not be used as the best? I consider 13 or 14 c.cm. is a very safe dose in practically every case, no matter how ill the patient may be (and it is particularly good in children), with proper premedication of omnopon and scopolamine. Especially do I say this because Mr. Lyall says more than 80% of the anaesthetics were administered by house-surgeons. Therefore, without any disparagement of house-surgeons, I think it will be agreed that he was often working at great disadvantage. Very good relaxation is a *sine qua non* in all these cases where tissues are friable, and it is important to reduce trauma to a minimum. And surely, with reference to shock, the anaesthetic that completely stops the painful stimuli from the very sensitive parietal peritoneum is the best to use. Scopolamine, by the way, should only be given in small doses to old people.

Further, I have found that with ether anaesthesia there is much more bleeding, which means prolonging the operation, and we cannot deny that with ether chest complications are exceedingly frequent. Indeed, I think it pays the surgeon to give his spinal analgesic himself, having developed his own technique; in this way he can practically always assure for himself an excellent analgesic, unless, of course, there is a skilled anaesthetist available with the necessary apparatus, and even then I would prefer to trust my own spinal. While the anaesthetist may have plenty or nothing to do, his presence is essential even if only for the valuable psychological help that he can be to the patient. The criticisms that are levelled against the use of spinal analgesia always appear very theoretical and based on exceptions, which would be a method of damning almost any anaesthetic in the whole list.

Finally, I have often thought that no young doctor should go as a ship surgeon without being master of one technique for the administration of spinal analgesia. He is quite unlikely to have a skilled anaesthetist for an emergency operation, but if he has his spinal he has complete command of the anaesthetic situation even though he may not have had a great deal of experience of, say, acute appendicitis; and things will be easier for him and safer for the patient.—I am, etc.,

Ilford. N. BEATTIE.

Stethoscope versus X Rays

SIR,—I usually read the "Reports of Societies" with pleasure and profit, but in the *Journal* of Dec. 15 (p. 856) the report of the meeting of the Section of Medicine of the Royal Society of Medicine on stethoscope *v. x* rays fills me with dismay and apprehension. That any learned society should discuss a subject under this heading is a mystery beyond my comprehension; it could only be equalled by the surgeons discussing rectal examination *v.* abdominal palpation. Most of the speakers obviously felt the limitations of the title and included in their remarks the full range of physical examination. Several appear to be thinking in terms of early tuberculosis, in which no one would dispute the pre-eminent value of radiology. It is distressing to read the statements attributed to physicians of repute; the following represent a random selection. "The stethoscope might be very useful as an adjunct to radiology." "It was difficult to avoid going through the gesture . . . of trying to hear vague mysterious sounds." "Clinicians, however, should continue to use the stethoscope, because patients expected to see it." Such may be relatively innocuous in a debate; if, however, they are deemed suitable for publication, they might well be taken as representing the views of speakers, most of whom are associated with the teaching of clinical medicine. Should this be the case I can only visualize their students as taking a history (60% importance) wearing a stethoscope for the same decorative reason as a mayor his chain of office, then busily signing the requisition for life-saving help from radiological and pathological colleagues. Thus the future medical services may in fact be staffed by clerks with a medical background.

This slightly exaggerated picture is nearer the actual facts than one likes to see. The essential trouble amongst the recently qualified is that they have not been taught to use the five senses God gave them. Especially is this so in the examination of respiratory disease—admittedly a difficult branch of medicine. I strongly advise senior students and the recently qualified to read Robert Coope's *Diseases of the Chest*. It will be a suitable antidote to any unfortunate impression they may have received from the stethoscope *v. x* rays discussion. Personally, should I fall ill with pneumonia, I hope the colleague who tends me will be armed with clinical nous and a stethoscope, keeping in reserve an exploring needle in case of need.—I am, etc.,

Brighton. R. C. HUTCHINSON.

Physical Therapy in Mental Disorder

SIR,—I am glad to find that once again Dr. D. W. Winnicott (Dec. 22, p. 901) has raised his voice in protest over the craze for physical "treatment" of mental diseases. Physical methods, medicinal or otherwise, have their place in these cases. But if the trouble be *really* mental, and not a physical disease with secondary mental symptoms, these methods are at best nothing but palliatives and at worst a real menace.

It is true that psychotherapists have not yet agreed, and probably never will agree, as to the exact aetiology of mental syndromes. But there is one thing which anybody with psychological insight will accept, which is that mental disease starts in the mind—which is not synonymous with the brain and nervous system—and that the physical troubles and the behaviour patterns that accompany them are only the last link in the chain. Thus, to talk of "cure" by leucotomy or electrical convulsions is not true. It would be as true to say that one has cured a car driver of the bad habit of scorching by cutting out some of the cylinders of his car as to claim cure by the former; while the latter is very similar to taking a jar of boiled sweets which have stuck together and shaking the jar: the sweets may come unstuck, and they may change their mutual relationship, but the contents of the jar still remain the same, and, sooner or later, the unremoved moisture will result in their settling down once again into a sticky lump. Surely it is a case of "rendering unto the body the things that are the body's and unto the mind the things which are the mind's," and of seeking out the causes of disease rather than attempt flashy results—i.e., in the case of mental troubles to treat the mind first and foremost.

Apart from dubious results, moreover, I agree with Dr. Winnicott that the drastic methods named above are a menace. I have seen two or three cases of patients already suffering from

shock treated, by practitioners who would probably shy if one suggested that they were using homoeopathy, by further shock. The result has been that instead of having one more or less serious trauma to deal with, one has had to try and deal with the double dose, the second one deliberately inflicted. As to leucotomy, again one wonders whether society is going to be any the better for having more or less decerebrated robots let loose in it, simply because they have been so mutilated as to be incapable of behaving badly.

Many will doubtless agree that medicine is primarily concerned with human beings: not with just one aspect of them, but with the whole man, bodily, psychic, and spiritual. It seems, therefore, that our standards should go further and reach deeper than to judge results merely by the outermost surface of that man—i.e., his behaviour. I suggest that, going beyond Dr. Winnicott's suggested "habeas cerebrum," what is required is "habeas hominem," so that we are not deceived by short-sighted views.—I am, etc.,

London, W.C.1. L. J. BENDIT.

SIR,—Whatever force there may be in Dr. D. W. Winnicott's protest (Dec. 22, p. 901) against a too-enthusiastic application of physical methods of treatment, such as electrical shock therapy and prefrontal leucotomy, in mental illness—and his protest appears to be only too well justified—there is strong reason to emphasize the need for an adequate appreciation of the psychological background in these cases, the psychological as well as the physical reactions of the patients to the treatment, and the psychotherapeutic requirements of the situation. This caveat would have been unnecessary a few years ago, but there is a perceptible "retreat from psychology" among a section of psychiatrists, both young and old, which, though only a passing phase not unconnected with the war, is likely to be unfortunate for patients while it lasts.—I am, etc.,

London, W.1. WILLIAM BROWN.

Descent of the Testis

SIR,—Dr. Mary Wood's suggestion (Dec. 15, p. 860) that the descended testis and scrotum of mammals "might be a means of sexual attraction in animals having few other visible sexual differences" is of the greatest interest, but it is difficult to understand how they could function in this way. The lower mammals generally, in contrast to the amphibians, typical reptiles, and birds, have a highly developed olfactory apparatus, including an expanded nasal cavity, numerous conchae, and complex nervous arrangements; and this apparatus is used for finding and following mates and for retrieving the young. Among reptiles, the snakes and lizards also use their sense of smell for finding mates and food, but in these forms it is Jacobson's organ that has been elaborated as the receptor, and it is only in some extinct mammal-like reptiles, related to the mammalian ancestral line, that a complex olfactory apparatus is known to have existed. Associated with these developments are the anal and other scent glands so widespread in the various orders of contemporary mammals. So in primitive mammals the only phase of the sexual cycle in which the scrotum could be of importance as a visual stimulant would lie between the approach, conditioned by scent, and actual contact, and it is difficult to see how it could function effectively.

In those mammals in which smell has become of relatively less importance in mating the scrotum has not become noticeably more conspicuous. In monkeys arboreal life has led to a secondary simplification of the olfactory apparatus and to the loss of the anal glands (though in lemurs the numerous conchae are retained and pairs follow each other and mothers their young through the branches largely by scent). Brightly coloured sexual skin and occasionally phalli and cheeks are found, but the scrotum is not particularly conspicuous. In ruminants the scrotum may certainly be large, but special sexual behaviour and often bodily features such as horns are more striking characters differentiating the sexes. In no group of mammals is there any parallel to the elaboration of form and colour associated with intimidation, courtship, and unpalatability found in the birds and amphibians, where visual, rather than olfactory, considerations are paramount.

In man, where with the thinning of the hair and the fully upright posture the scrotum has become more conspicuous, it is not that organ which has been chosen for ornamental elaboration: it is rather the breasts (*Homo* is the only genus in which the non-lactating breast remains large and fatty), the buttocks (particularly in the Bushman-Hottentot), the umbilicus (more conspicuous in *Homo* than in other animals equally well provided with subcutaneous fat), and the dimples over the posterior superior iliac spines. Possibly hairlessness itself was conditioned by sexual rather than by natural selection (suppression of vermin). Opinions may differ as to whether, judging from the results, our ancestors showed good aesthetic appreciation and chose their mates well, but there is no evidence that in us or in other mammals the scrotum has played any particular part as a centre of attraction. The descent of the testis remains one of the mysteries of evolution, in spite of the partial solution so clearly put forward by your contributor Mr. Badenoch (Nov. 3, p. 601).—I am, etc.,

Anatomical Department, St. Thomas's Hospital, S.E.1. R. WHEELER HAINES.

Routine Treatment of Malaria with Intravenous Quinine

SIR,—During the Japanese occupation of Hong Kong, when forced by economic reasons and shortage of drugs, the routine treatment of malaria was with intravenous quinine. It has been shown in a series of 100 patients that the slow injection of quinine dihydrochloride by this route has great advantages, for it is absolutely painless and does not lead to necrosis of the muscular tissue of the buttocks as intramuscular injections do even under sterile conditions. The plasmodia in the blood stream disappear rapidly, the fever drops in one to two hours after the injection, and the temperature usually reaches normal much more quickly than after intramuscular application. I have used intravenous quinine dihydrochloride not on specially selected material, but on the undernourished population of Hong Kong under Japanese rule. The dosage was 0.25 to 0.5 gramme in 1 c.cm. distilled water. I did not use glucose because it was too expensive. The injection took two minutes, and aspirated blood was constantly mixed with the solution of quinine. The temperature in 95 cases fell to normal after one injection only, while in 5 cases (subtertian malaria) a second injection was necessary five hours after the first. Racially the 100 patients were 10 Europeans, 36 Chinese, 54 Indians. The last group were watchmen or prisoners of war in a very bad physical condition. The reactions of the patients are given below:

Reaction	Objective and Subjective Signs	Number of Cases	Kind of Malaria
None		80	73 tertian 4 quartan 3 subtertian
Slight	Feeling of heat in chest and of slight pressure on the heart	15	12 " 3 tertian
Moderate	Dizziness, nystagmus, nausea, burning sensation in chest	3	2 mixed 1 subtertian
Severe	Severe dizziness, nausea, tachycardia, extrasystole	2	2 "

No patient collapsed and no death was reported. I conclude that it is better to use quinine dihydrochloride intravenously than intramuscularly, as this route is safe and quick and all the quinine administered enters the blood stream.—I am, etc.,

Hong Kong. W. WINTERSTEIN.

National Research into Tuberculosis

SIR,—The suggestion put forward by Dr. George Luntz in his letter (Dec. 1, p. 781) is not only very timely but in a sense rather overdue. I have now been connected for about three years with one of the largest sanatoria and E.M.S. hospitals in the country. The difference between the two types of patients (tuberculous and E.M.S.) is so tragically glaring that it cannot be missed. The age groups of Service tuberculous cases and Service casualties from all other causes are broadly the same. But whereas a patient in the latter group, with the help of sulphonamides, penicillin, and plastic and modern orthopaedic surgery, stands a very fair chance of getting over his disabilities, one in the other group (tuberculous), in spite of all modern medical and surgical treatment, stands with the sword of Damocles perpetually hanging over his head.

Tuberculosis is a disease by itself. Its insidious onset often makes it very difficult to diagnose in time. Its infectivity, which is a very real source of danger to the last day of the patient's life and whose main victim is the youth of the nation, makes it a national problem of very great importance. Further, due to its chronicity, it is not amenable to short-time "isolation policy" as is possible with smallpox and other similar infectious diseases. There is no disease in the country which can compare with tuberculosis in all its implications and tragedies; this indeed is a disease which does not die with the patient.

In modern times, when scientific research has given us the sulphonamides, penicillin, radar, and the atomic bomb, is it too much to hope that concentrated research as suggested by Dr. Luntz will find an answer to this problem, which is, from both the individual and the national aspect, of priority importance.—I am, etc.,

London, W.2. H. C. MUKERJI.

Questionaries, Past and Future

SIR,—"The blast of war blows in our ears. . . . The game's afoot!" A week or two ago the headlines of a Sunday newspaper told us that all voluntary hospitals are to be taken over by the Government. When questions were raised the statement was not withdrawn but reaffirmed in the next issue. Then follows Mr. Aneurin Bevan's statement in the House of Commons, on Dec. 6, 1945, on: (*a*) Abolition of the sale and purchase of practices; (*b*) "proper distribution" of doctors (i.e., direction); (*c*) "appropriate measure of compensation"; (*d*) "great satisfaction with which this statement will be received by most doctors." This menacing pronouncement threatens the very foundations of our professional life, is in direct conflict with our oft-repeated principles, and will inevitably lead to a whole-time salaried State medical service. Personally, I believe compensation will take the form of a pension, which will have the effect of strengthening Government control over us: in other words, there will be no compensation unless we enter the service.

I am surprised to read in the *Journal* of Dec. 15 (p. 851) that there still persists a naive belief in the B.M.A.'s Questionary issued about two years ago, and am disturbed to think that our policy may be based unduly on its results. The Questionary was a blunder, inasmuch as (by the ambiguous manner in which it was framed) the results could not possibly be a true reflection of the views of the profession. And even if this is not admitted, I contend that the Questionary is now out of date. We now see the issues at stake more clearly, and have more considered views. And we have a Government in power of whose policy we are in little doubt. I earnestly suggest, therefore, that the time is very ripe for the B.M.A. to issue a short Questionary based on fundamental issues—direct unequivocal questions that can easily be answered "Yes" or "No." For your consideration and that of the profession in general I suggest the following:

(1) Are you in favour of a whole-time State salaried service?
(2) Do you favour abolition of the sale and purchase of practices?
(3) Do you consider it essential for the welfare and independence of the profession and in the public interest that private practice should continue?
(4) Are you in favour of the compulsory inclusion of 100% of the population in any service?
(5) Are you opposed to any form of local government control of the profession?
(6) Are you opposed to any form of direction of doctors?
(7) Should the voluntary hospital system be preserved?

Some time ago we here in Perth sent out a similar questionary to 123 doctors in this area, with most satisfactory results. Suffice it to say that if the replies are a reflection of the views of individual doctors throughout the country then the questionary I suggest would greatly strengthen the hands of our negotiators. "'Tis a consummation devoutly to be wished."—I am, etc.,

Perth, Scotland. ROBERT RITCHIE.

D. P. Barr and E. Shore (*Ann. intern. Med.*, 1945, **23**, 754) treated 100 cases of Graves's disease with thiouracil and obtained remissions in 87. Mild and many recurrent cases were easily brought under control. On the other hand large nodular goitres responded less readily.

Obituary

SIR ARTHUR BALL, Bt., M.D., M.Ch.

We regret to announce that Sir Arthur Ball, Regius Professor of Surgery in the University of Dublin for the past twelve years, died suddenly at Carrickmines, Co. Dublin, on Dec. 21.

Charles Arthur Kinahan Ball, born on March 29, 1877, was the eldest son of Sir Charles Bent Ball, first baronet, honorary surgeon in Ireland to King Edward VII and King George V; nephew of Sir Robert Stawell Ball, F.R.S., the astronomer whose writings and popular lectures reached a very wide audience; and grandson of Robert Ball, LL.D., the well-known Dublin naturalist who came of an old Devon family which settled in Ireland in 1651. Arthur Ball graduated B.A. from Trinity College, Dublin, in 1898, with honours in natural science, took the M.B., B.Ch., and B.A.O. degrees in 1900, and the M.D. in 1902, in which year he won the surgical travelling prize. He was elected F.R.C.S.I. in 1905 and received the M.Ch. degree of Dublin University thirty years later. After a demonstratorship of anatomy at Trinity College and post-graduate study in Berne and Baltimore he became house-surgeon and later assistant surgeon to Sir Patrick Dun's Hospital, of which his father was an ornament. He was also elected surgeon to Monkstown Hospital and a number of other institutions in and around Dublin, and lectured on operative surgery at Trinity College and examined for the Royal College of Surgeons in Ireland. He succeeded to the baronetcy on March 17, 1916, and in 1933 was appointed Regius Professor of Surgery, as his father had been many years earlier.

Sir Arthur Ball joined the British Medical Association in 1902 and held office as secretary of the Section of Surgery at the Birmingham Annual Meeting in 1911. He was a member of the Council of the Royal Zoological Society of Ireland and past-president of the Dublin University Biological Association, thus continuing the active interest taken by his grandfather in each of those scientific bodies. He published a number of papers on urological subjects in this and other journals, and his presidential address to the Section of Surgery of the Royal Academy of Medicine in Ireland on "Progress of Renal Surgery" appeared in the *Dublin Journal of Medical Science* in 1912. He married in 1907, but had no child, and his brother, Nigel Gresley Ball, Sc.D., late professor of botany at University College, Colombo, succeeds to the title.

SIR FARQUHAR BUZZARD

Dr. GORDON M. HOLMES writes:

Apart from his work while he presided over the medical faculty at Oxford and his services to the Nuffield Trust, particularly in the reorganization of hospital facilities and teaching in provincial centres, in which his exceptional organizing ability was recognized, Buzzard occupied a prominent place in contemporary medicine.

Even in the early years of the century when he held the post of pathologist at the National Hospital, Queen Square, his clinical ability was rated so highly that his help and advice on difficult problems which arose in the wards of the hospital were regularly sought by his junior colleagues. As the years passed and his experience grew, his opinion and judgment came to be more widely appreciated in other branches of clinical medicine as well as in neurology. He possessed an exceptionally developed clinical instinct, and an ability to take into account and weigh up every side of each problem that confronted him, which was supplemented by an adequate knowledge of the anatomy and pathology of the nervous system. Although his name is not associated with any important discovery or notable addition to knowledge, he made several valuable contributions to neurology, as the clinical differentiation and morbid anatomy of subacute combined degeneration of the spinal cord, in which he was associated with Batten and Collier.

His deliberate manner and his slow and cautious expression of opinion may have diminished his popularity as a teacher, but his classes and demonstrations both at St. Thomas's Hospital and at the National Hospital were highly appreciated by more

advanced and thoughtful students, and particularly by post-graduates.

Buzzard's friends and colleagues will, however, ever remember him for his personal qualities: his sincerity and obvious honesty, his acute sympathy and his willingness to help in difficulties of any nature, his wide interests, and the cheerfulness he brought to any company he entered.

The following well-known medical men have recently died abroad: Dr. GASTON MILIAN, the eminent French dermatologist; Dr. WALTER BIGLEN, a St. Gallen gynaecologist and an authority on Paracelsus; Dr. JEAN TROISIER, professor at the Paris faculty of medicine and Institut Pasteur and an authority on tuberculosis and cancer; Dr. FRITZ RUTISHAUSER, the first Swiss psychiatrist for abnormal children and young persons, aged 70; Dr. W. W. HERRICK, professor of clinical medicine in the College of Physicians and Surgeons at Columbia University and president of the New York Academy of Medicine; Dr. JUAN SANCHEZ COVISA, emeritus professor of dermatology in the Madrid faculty of medicine.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Applications for the John Lucas Walker Studentship, the holder of which must devote himself to research in pathology, are invited, and should be sent, accompanied by testimonials, references, and copies of papers containing published work, before April 20, 1946, to Prof. H. R. Dean, Department of Pathology, University of Cambridge, to whom also applications for further information regarding the studentship may be addressed. Persons of either sex may be candidates. The Studentship is tenable for such period and is of such annual value not exceeding £500 as the Professor of Pathology, with the approval of the Managers, may determine.

At a Congregation held on Dec. 15 the following medical degrees were conferred, all by proxy except where indicated by an asterisk:

M.D.—A. H. Masina, *W. P. Purvis.
M.B., B.CHIR.—W. S. R. Fenton, D. A. Bailey.
B.CHIR.—J. F. Paterson.

The examination for the degree of M.Chir. will be held on Feb. 19, 20, 22, and 23.

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part II (Principles and Practice of Physic, Pathology, and Pharmacology)*: R.C. Allison, A.C. Arthur, J. C. Bayliss, J. P. M. Bensted, J. E. Blundell, F. J. Conway, D. G. Davidson, W. H. Davies, E. W. Deane, A. M. Dorey, N. K. Dryden, A. L. T. Easton, J. O. P. Edgcumbe, E. Ellis, R. H. Ellis, T. A. Evershed, A. E. Flatt, A. L. Furniss, D. A. G. Galton, E. B. Gethen Smith, J. H. Gough, R. N. Grabowsky-Atherstone, B. A. J. C. Gregory, D. Hamilton, P. H. Hewitt, W. A. A. Hodges, E. M. James, J. Jordan, M. C. Joseph, P. B. Kunkler, P. K. Ledger, A. H. Littlewood, P. N. Magee, P. A. Merton, J. B. Metcalfe, R. I. Milne, P. D. Mort, G. S. Ostlere, P. P. Philip, J. E. Pitts, B. R. Pollard, C. W. A. Pullan, B. O. Reed, J. T. Rowling, C. C. D. Shute, I. B. Smith, R. H. Thomlinson, P. H. Walker, M. W. P. Ward, P. Watson, R. H. Wilkinson, C. J. Wilson. *Women*: K. A. C. Bowen, M. A. Brown, M. C. Myddelton.

UNIVERSITY OF LONDON

Ralph Ford Tredre, M.D., D.P.H., D.T.M.&H., has been appointed Assistant Director of the Ross Institute of Tropical Hygiene, which is incorporated in the London School of Hygiene and Tropical Medicine. The appointment dates from October last.

Aubrey Lewis, M.D., F.R.C.P., has been appointed to the university chair of psychiatry tenable at the Maudsley Hospital, where he has been clinical director since 1936.

The title of professor of applied physiology in the University has been conferred on Guy Pascoe Crowden, D.Sc., M.R.C.P., in respect of the post now held by him at the London School of Hygiene and Tropical Medicine.

J. H. Birkinshaw, D.Sc., has been appointed to the university readership in biochemistry tenable at the London School of Hygiene and Tropical Medicine.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

The Medical Research Council and University College Hospital Medical School have jointly appointed Edward Eric Pochin, M.B., B.Chir., M.R.C.P., to be Director of the Department of Clinical Research, in place of the late Sir Thomas Lewis, as from Jan. 1. Dr. Pochin has also been appointed an honorary physician to University College Hospital.

UNIVERSITY OF BRISTOL

Robert Milnes Walker, M.S., F.R.C.S., has been appointed to the newly established Chair of Surgery in the University.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

M.D.—J. R. Hughes, C. McGibbon, H. Reid.
M.B., CH.B.—*† R. G. Thomas, *‡L. F. Tinckler, *‡Esmé M. Wren. *Part III*: Audrey M. Ashcroft, N. L. Bailey, †K. Baker, S. Beacon, D. T. Binns, R. Brearley, P. M. Bretland, Cécile N. Broster, J. H. E. Carmichael, Helen A. Cawson, A. D. Charnley, M. H. Clark, N. Coulshed, S. Croft, Pauline M. Dean, M. M. I. el Haddad, R. Ellam, H. C. Graham, E. A. Harris, F. G. Ince, R. W. Kennon, Barbara M. Killick, T. S. Law, Jean Learoyd, A. C. Levinson, T. R. Littler, J. A. O'Garra, A. E. Pritchard, Rachel M. Rawcliffe, G. P. Reed, H. Roberts, W. G. Roberts, P. W. Robertson, Olive R. Rodgers, L. Rosenbloom H. H. Slack, Helen M. Taylor, L. Temkin, J. Ward, Joyce Watson, N. P. Watson, W. F. Wille, Aline N. Wynroe. *Passed in Separate Subjects*: Ailsa M. Heath (Medicine and Obstetrics and Gynaecology), Maureen M. Hoey (Surgery and Obstetrics and Gynaecology), D. T. L. Hughes (Medicine and Surgery), H. S. Levy (Medicine and Surgery), F. W. Sheffield (Medicine and Surgery).

* With second-class honours. † Distinction in surgery. ‡ Distinction in obstetrics and gynaecology.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

Dr. Hugh Edward Magee will deliver the Milroy Lectures on Tuesday, Feb. 12, and Thursday, Feb. 14, at 5 p.m. at the College, Pall Mall East. His subject is "Application of Nutrition to Public Health—Some Lessons of the War." Tea will be served before the lecture.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Sir William H. Collins and Sir Henry Dale, O.M., G.B.E., F.R.S., have been elected Honorary Fellows of the Royal College of Surgeons. Sir William Collins is one of the greatest benefactors in the history of the College, having endowed professorships of anatomy and pathology in recent years. Sir Henry Dale, when President of the Royal Society, was a Trustee of the Hunterian Collection and has also been associated with the College through his membership of the Council of the Imperial Cancer Research Fund.

At an ordinary meeting of the Council of the College, held on Dec. 13, Sir Alfred Webb-Johnson, Bt., President, in the chair, diplomas of Fellowship were granted to the following successful candidates:

R. H. Gardiner, F. T. Moore, K. F. Hulbert, H. H. Barst, F. D. Hindmarsh, J. E. Malcolm, D. Wynn-Williams, S. Muntarbhorn, R. A. Gill, V. G. Patel, P. W. Brand, D. R. Barnes, G. L. W. Bonney, J. Zimmerman, P. G. Somerville, R. E. Waterston, I. D. Gebbie, W. H. Rothwell, R. S. Hooper, E. E. O'Malley, W. Hawksworth, L. Gillis, M. Kaye, J. W. Spence, G. R. Nicks, W. K. Yeates, G. Harrison, V. G. Griffiths.

A diploma of membership was granted to Janet Gordon (King's College, London).

Diplomas in Anaesthetics were granted, jointly with the Royal College of Physicians of London, to the following successful candidates:

Valerie M. Adamson, C. R. G. Barrington, C. H. D. Bartley, F. H. Blackburn, R. I. Bodman, G. Bourne, A. Brown, W. M. Brown, J. D. Buxton, E. S. Curtiss, S. G. de Clive-Lowe, I. A. Donaldson, C. Frost, P. R. Gavin, H. S. H. Gilmer, E. G. Godwin, J. M. Graham, J. Greenhalgh, The Hon. E. B. Hacking, L. A. T. Hamilton, Beryl L. Harrison, Monica L. Hawkins, A. N. Hobbs, M. Holborow, J. Howell, Margaret M. G. Joad, G. T. Johnson, G. S. A. Knowles, H. T. Knowles, O. V. S. Kok, Gwenda M. Lewis, B. R. Little, A.-M. MacKay, J. M. MacKinnon, F. G. Mackintosh, J. A. McNab, Elizabeth H. Milne, D. A. Naismith, Olive I. Nicholson, P. T. Northover, J.-R. O'Dowd, M. B. O'Neill, M. W. Ll. Owen, J. A. Peart, P. B. Percheson, E. H. D. Phillips, R. I. Probert, Barbara C. Roberts, A. H. Saleh, C. E. Shafto, C. R. Stephen, Elizabeth D. S. Stephen, K. F. Stephens, R. J. M. Steven, A. H. Swithinbank, Evelyn H. Terry, K. S. Thom, J. P. Thomas, C. P. K. Toland, F. L. Turner, W. J. U Tin, Daphne V. Veale, G. L. Were, R. U. Whitney, G. M. Wyant, J. B. Wyman.

Messages of greeting from the College were recently conveyed to the Royal Australasian College of Surgeons by two members of the Council now in Australia—Surg. Rear-Adm. G. Gordon-Taylor and Surg. Capt. Lambert Rogers. Copies of the messages and the reply from the President of the Royal Australasian College of Surgeons, Mr. H. R. G. Poate, were before the Council.

St. James's Hospital, Leeds, was recognized for the resident surgical post required of candidates for the Final Fellowship examination in respect of the posts of resident surgical officer and first house-surgeon.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh held on Dec. 19, with Mr. Jas. M. Graham, President, in the chair, the following candidates, having passed the requisite examinations, were admitted Fellows:

D. W. A. Degazon, W. H. Fahrni, J. F. M. Fraw, E. Garland-Collins, N. O. K. Gibbon, R. Hodkinson, W. Irving, M. J. Kelleher, J. H. Kirkham, J. R. F. Mills, R. C. Rider, I. C. Simpson, F. Smith, W. M. Toone.

Dr. A. B. Alexander has been notified that the Fellowship of the American College of Surgeons (F.A.C.S.) was formally conferred upon him, *in absentia*, in Chicago on Nov. 30, 1945.

The Services

Air Vice-Marshal T. J. Kelly, C.B.E., M.C., has been appointed an Honorary Surgeon to the King in succession to Air Vice-Marshal F. C. Cowtan, C.B., who has vacated the appointment on retirement from the R.A.F.

Major (Acting) B. H. Price, R.A.M.C., has been appointed M.B.E. (Military Division) in recognition of gallant and distinguished services in the field.

Surg. Cmdr. J. F. Heggie, R.N.V.R., has been awarded the R.N.V.R. Officers' Decoration.

The following appointments and mentions in dispatches have been announced in recognition of gallant and distinguished services while prisoners of war:

O.B.E. (Military Division).—Lieut.-Cols. D. A. McM. Crawford, G. T. Hankey, and T. H. Wilson; Lieut.-Cols. (Temp.) J. C. Mackay, M.C., T.D., and D. H. Thompson; Major W. R. Henderson, R.A.M.C.

M.B.E. (Military Division).—Major J. G. Lawson; Majors (Temp.) S. W. Barber, G. MacN. R. Duffus, R. Harvey, C. W. Horncastle, P. D. C. Kinmont, L. W. Lauste, J. B. Sherman, W. S. Sykes, and A. W. Woolley; Capts. P. T. Cooper, W. O. James, E. W. MacMillan, W. M. Nichols, I. F. Rose, and D. Taverner, R.A.M.C.

Mentioned in Dispatches.—Lieut.-Col. (Acting) A. G. D. Whyte, M.B.E. Major B. B. Hosford; Majors (Temp.) W. M. Davidson, R. R. Gordon, M.C., W. R. Hunter, C. W. A. Kimbell, J. Parkes, P. Smith, and A. McL. W. Thomson; Capts. J. H. Annan, M.B.E., R. E. Bonham Carter, A. M. Boyd, J. C. Cameron, E. F. M. Caraher, J. E. S. Carmichael, G. D. Cribb, A. Crook, G. I. Davidson, G. Forrest-Hay, W. K. Frewen, J. H. Gibson, S. S. B. Gilder, R. W. Gunderson, D. R. Holden, W. S. Holden, D. G. Howatson, W. I. S. Hudleston, C. W. Iliffe, J. A. James, G. S. A. Knowles, D. W. Lacey, F. B. Lake, N. R. Lansdell, R. P. Lawson, M.C., W. Lumsden, I. R. I. MacDonald, L. MacLean, A. Macnab, A. Mikellides, N. E. Monteuuis, A. F. Murray, G. F. R. Parker, R. Pollock, D. H. Randall, R. Robertson, R. L. Sanderson, I. Schrire, C. A. Simmons, L. F. Smith, I. O. B. Spencer, I. McD. G. Stewart, A. C. P. D. Thomson, M.C., C. E. C. Wells, and R. M. Wiltshire; Lieut. J. Gottlieb, R.A.M.C.

Medical Notes in Parliament

During the autumn sittings the Parliamentary Medical Group under the chairmanship of Dr. Haden Guest has concerned itself with a number of matters connected with demobilization. These included the release of requisitioned accommodation in medical schools, the release of medical teachers from the Forces, and the acceleration of the demobilization of medical practitioners. After the House of Commons resumes on Jan. 22 the committee will consider the arrangements for the care of the aged in sickness and health.

The Royal Assent was given on Dec. 20 to the Finance (No. 2) Act, the Public Health (Scotland) Act, and the Workmen's Compensation (Pneumoconiosis) Act.

Tuberculosis Contracted by Nurses

While the National Insurance (Industrial Injuries) Bill was before a Standing Committee of the House of Commons on Dec. 4, Mrs. BRADDOCK moved to provide that in the case of nurses contracting tuberculosis during nursing employment, or within six months afterwards, the disease should be deemed to arise from the carrying out of such nursing employment. She said that in the Civil Nursing Reserve nurses were entitled to a special pension when they had contracted tuberculosis or any other infectious disease.

The CHAIRMAN OF THE COMMITTEE suggested that this amendment could be discussed together with a similar one relating to workers in the cotton textile industry who contracted epithelioma or spinners' cancer.

Mr. JAMES GRIFFITHS, replying for the Government, said spinners' cancer would be covered by the new Bill and he would have jurisdiction to prescribe the time limit. He was considering the desirability of extending this beyond 12 months. He asked Mrs. Braddock to withdraw her amendment because he did not wish the clause to mention the people to whom it applied. It was a general clause enabling him to prescribe an injury or a disease. That was being considered for the nurses in consultation with the Ministry of Health and the Department of Health for Scotland. He hoped to arrive at a decision before long.

Mrs. Braddock withdrew her amendment.

Penicillin for the Public

Mr. Wilmot (Minister of Supply) was asked on Dec. 17 whether he would arrange for penicillin to be sold to the public in tablet form "to avoid the hardship, inconvenience, and expense of having to go to hospitals, clinics, or surgeries for injections." Mr. WILMOT replied that treatment with penicillin otherwise than by injection could not at present be recommended for general use. Extensive research was being carried out. As soon as a suitable technique was established, steps would be taken to make the necessary preparations of penicillin available in accordance with the recommendations of the medical authorities of the Ministry of Health.

German Scientists for Britain

Sir STAFFORD CRIPPS stated on Dec. 19 that it was proposed to recruit, on the recommendations of the responsible Department, a strictly limited number of German scientists and technicians of the highest grade for service in this country, in the first instance for a period of six months. In general these experts would work in Government establishments, or for research associations sponsored by the Department of Scientific and Industrial Research.

Beds for Tuberculosis

Mr. BEVAN told Mr. Pritt on Dec. 20 that the number of persons awaiting sanatorium treatment for tuberculosis was about 5,000 and the number of beds normally available, but at present out of use owing to shortage of staff, was about 3,000. All possible measures to remedy the shortage of staff were being taken by his officers and those of the Minister of Labour. The importation of displaced persons for this work was under consideration, but was not without difficulty.

Mr. BUCHANAN stated that in Scotland the total number of beds available in sanatoria for tuberculous patients was approximately 6,700, but it was estimated that 500 of them could not be used through shortage of nursing staff. At Sept. 30 the number of persons on the Scottish local authorities' waiting lists was 1,703, including fully 1,000 from Glasgow.

New National Insurance Bill

Mr. JAMES GRIFFITHS presented on Dec. 20 the National Insurance Bill to establish an extended system of national insurance, providing payments by way of unemployment benefit, sickness benefit, maternity benefit, retirement pensions, widows' benefit, guardians' allowance, and death grant, to repeal or amend existing enactments relating to national health insurance and other schemes, and to provide for the making of payments towards the cost of a national health service. Answering questions about this Bill, Mr. Griffiths said he hoped it would be available before the House resumed in January, but owing to the complexities of the task it might not be possible to have the Bill printed until shortly after the House resumed its sitting on Jan. 22. He believed his would not prejudice the Government's intention to get the Bill on the Statute Book before the summer recess.

Manufacture of D.D.T.

Replying on Dec. 20 to Sir Patrick Hannon, Sir STAFFORD CRIPPS said the factories where D.D.T. was manufactured during the war were still in operation. One firm began commercial distribution of its product last September. It was proposed to give the other producers an early opportunity of making D.D.T. for their own account, subject to provision for current and future requirements of the fighting Services and other Government demands.

Permanent Medical Staff of R.A.F.

Mr. STRACHEY stated on Dec. 20 that 139 medical officers held permanent commissions in the R.A.F. In addition 56 officers had recently been selected for permanent commissions. Thirty-five officers had been offered extensions for four years. Thus far five had accepted. In the second half of 1945, 880 medical officers would have been released and recruitment during the same period would have been *nil*.

Hospital Survey of West Midlands

The report for the West Midland area on the hospital services in the regional district included in the survey was issued on Oct. 24 for consideration by those concerned, locally and centrally, in the future planning and organization of hospital services. Mr. BEVAN said on Dec. 20 that action on the recommendations made would be premature in advance of the organization and development of the health services as a whole.

Food of Displaced Persons.—Mr. J. HYND, in a statement on Dec. 20, said that in the British zone in Germany displaced persons

had absolute priority over the German population in regard to food. A minimum ration scale of 2,000 calories a day was prescribed with additions for special categories. This was much in excess of what was being received by the Germans. At one assembly centre near Belsen, where a large number of displaced persons were accommodated, the hospital was administered by U.N.R.R.A. There was an adequate supply of medicine and the hospital was well fitted and well run. Some German doctors and nurses worked there under the direction of U.N.R.R.A. doctors. The food scale in force provided 2,913 calories per day for nursing and expectant mothers.

Superannuation of Asylum Officers.—Asked by Mr. Rhys Davies on Dec. 20 to introduce a short Bill to amend the Asylums Officers Superannuation Act, 1909, so as to remove the anomaly whereby an employee was not allowed the return of his contributions on voluntary resignation when not guilty of misconduct, Mr. BEVAN promised to consider this suggestion with others made from time to time for the amendment of the law relating to the superannuation of local government and other officers. He added that he held out no hope of early legislation on these matters.

Priority Milk.—About 600,000 adult consumers, other than expectant mothers and mothers of infants, receive priority milk. The Ministry of Food is inquiring whether any tightening of the procedure is needed. Sir Ben Smith is advised that there are no nutritional grounds for allowing extra milk to old-age pensioners.

Shortage of Medicine Bottles.—Sir E. GRAHAM-LITTLE asked on Dec. 19 about the shortage of medicine bottles. Sir STAFFORD CRIPPS said glass bottles were in short supply, but priority was given to bottles required for food, drink, and medicines. He was considering with Mr. Isaacs what further steps could be taken to increase the workers in the industry.

Notes in Brief

The Interdepartmental Committee on Dentistry has submitted its final report, which will be published as a Command Paper.

An allocation of sugar is to be made by the Ministry of Food to a firm manufacturing homoeopathic medicines for export.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* the chief features of the returns were large increases in acute pneumonia (225 more cases) and dysentery (71 more cases). The only other variations of note were decreases in whooping-cough and scarlet fever (30 and 26 fewer cases). Only small changes occurred in the local incidence of scarlet fever and whooping-cough.

Measles showed an increase in Suffolk (43) and a decrease in Lancashire (46).

Diphtheria cases increased in Yorks West Riding (17) and Suffolk (12), and decreased in Durham (17) and Lancashire (14).

Dysentery was reported from Hertfordshire, Hatfield R.D., where there was a large outbreak involving 90 persons. Other large returns were Lancashire 51, London 44, Yorks West Riding 20, Essex 13, Warwickshire 10.

In *Scotland* a large fall (63) was recorded in the incidence of pneumonia. There were 28 fewer cases of diphtheria, while scarlet fever rose by 27. The fall in diphtheria was mainly due to Glasgow, where the cases fell from 84 to 62.

In *Eire* the only variations in the trends of infectious diseases were a fall in measles (21) and an increase in whooping-cough (17). In Dublin C.B. 33 further cases of diarrhoea and enteritis were notified.

Quarterly Returns for Northern Ireland

The birth rate during the September quarter was 21.8 per 1,000, compared with 22.5 for the average of the five preceding third quarters. Infant mortality was 53 per 1,000 registered births—15 below the average for the five preceding September quarters. Maternal mortality was 3.2 per 1,000 births, which is the same rate as the five-years average. The general death rate was 10.1 per 1,000, which was 1.1 below the five-years average. Deaths from pulmonary tuberculosis were 171, and from other forms of tuberculosis 50, these totals being 42 and 19, respectively, below the average of the five preceding third quarters. Deaths from epidemic diseases included 97 from diarrhoea and enteritis under 2 years of age, 14 from whooping-cough, 10 from influenza, and 7 from diphtheria.

Week Ending December 22

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,718, whooping-cough 1,100, diphtheria 569, measles 623, acute pneumonia 1,166, cerebrospinal fever 43, acute poliomyelitis 23, dysentery 230, paratyphoid 4, typhoid 5.

No. 50

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each Infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1945 (a)	(b)	(c)	(d)	(e)	1944 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	44	2	19	—	1	37	3	18	—	1
Deaths		—	—				1	—		
Diphtheria	575	46	153	79	19	463	20	142	108	16
Deaths	10	—	2	1	—	7	—	4	2	—
Dysentery	313	44	49	4	—	201	27	101	—	—
Deaths				—	—				—	—
Encephalitis lethargica, acute	1	—	—	—	—	1	—	—	—	—
Deaths		—					—			
Erysipelas			42	17	3			46	4	1
Deaths		—					—			
Infective enteritis or diarrhoea under 2 years				39					24	
Deaths	42	5	8	19	—	32	4	9	9	5
Measles*	619	42	106	167	4	8,985	114	528	37	251
Deaths	—	—	—	—	—	7	—	1	—	—
Ophthalmia neonatorum	68	6	15	—	—	76	4	22	—	—
Deaths										
Paratyphoid fever	1	—	—	1 (B)	—	5	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal†	969	69	4	4	1	725	27	5	6	—
Deaths (from influenza)	69	6	1	1	1	21	1	7	1	—
Pneumonia, primary			205	21				345	29	
Deaths		68		19	6		33		18	15
Polio-encephalitis, acute	2	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	10	2	1	1	—	5	1	—	1	1
Deaths		—					—			
Puerperal fever		4	10		—		2	9		1
Deaths										
Puerperal pyrexia‡	113	5	10	—	—	123	3	15	—	—
Deaths		1					—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,753	168	307	22	49	1,990	60	295	40	60
Deaths	2	—	2	—	—	2	—	—	—	—
Smallpox	—	—	—	—	—	1	1	—	—	—
Deaths				—	—				—	—
Tyrhoid fever	6	—	6	4	—	7	—	1	5	—
Deaths	—	—	—	—	—	—	—	—	—	—
Tyrhus fever	—	—	—	—	—	—	—	—	—	—
Deaths				—	—				—	—
Whooping-cough*	1,195	86	65	42	5	1,343	53	134	54	12
Deaths	3	—	—	1	—	3	—	2	1	—
Deaths (0–1 year)	423	61	49	49	9	350	29	70	42	36
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,775	907	684	218	107	5,069	719	695	233	150
Annual death rate (per 1,000 persons living)			15·5	14·1	§			16·1	15·1	§
Live births	6,672	875	824	364	257	6,806	692	900	304	266
Annual rate per 1,000 persons living			16·5	23·5	§			18·4	19·7	§
Stillbirths	213	21	33			224	13	31		
Rate per 1,000 total births (including stillborn)			39					33		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes puerperal fever for England and Wales and Eire.

§ Owing to movements of population, birth and death rates for Northern Ireland are still not available.

Medical News

Authors of original articles and medical memoranda published in this *Journal* will from now onwards be entitled to 50 free reprints, and will be charged only for the number ordered in excess of this.

The twenty-ninth course of instruction for a Diploma in Psychological Medicine will open at the Maudsley Hospital Medical School, Denmark Hill, S.E.5, on Jan. 7, and will comprise a large number of lectures and clinical demonstrations. All inquiries about the course should be addressed to Dr. W. W. Kay, acting honorary director of the Maudsley Hospital Medical School, Central Pathological Laboratory, at West Park Hospital, Epsom, Surrey (telephone: Epsom 1408). Clinical instruction in psychiatry will be arranged, for students who desire it, to satisfy the requirements of the various examining bodies in respect of clinical experience of mental disorders for a D.P.M.

Prof. Willem Noordenbos, Hon. F.R.C.S., who holds the chair of surgery in the University of Amsterdam, will deliver the Moynihan Lecture, on the choice of oblique and transverse incisions in abdominal surgery, at the Royal College of Surgeons of England, Lincoln's Inn Fields, W.C., on Wednesday, Jan. 9, at 5 p.m.

The Pharmaceutical Society of Great Britain has arranged a meeting at 17, Bloomsbury Square, London, W.C., on Thursday, Jan. 10, at 7 p.m., when the Harrison Memorial Medal will be presented to Mr. Reginald Robert Bennett, B.Sc., F.R.I.C. After the ceremony Mr. Bennett will give an address in which he will deal with pharmocopoeia revision, and will review historically the part which pharmacists have played in this work since the Medical Act of 1858 vested in the General Medical Council responsibility for producing and publishing the *British Pharmacopoeia*.

A joint meeting of the Microbiological Panel of the Food Group of the Society of Chemical Industry with the Society for Applied Bacteriology will be held on Jan. 9, at 2.15 p.m., in the rooms of the Chemical Society, Burlington House, Piccadilly, W., when papers will be read on heat-resistance of micro-organisms, on some problems in the bacteriology of rivers, and on mould growth on leather. Members may introduce friends in person. The office of the Society of Chemical Industry is at 56, Victoria Street, S.W.1.

The European Association of Clinical Pathologists will hold its annual general meeting at Glaxo Laboratories Ltd., Greenford, Middlesex, on Saturday, Jan. 12, at 10 a.m.

A meeting of the Eugenics Society will be held in the rooms of the Royal Society, Burlington House, Piccadilly, W., on Tuesday, Jan. 15, at 5.30 p.m., when Dr. Eliot Slater will discuss "An Investigation into Assortative Mating," and Mrs. Moya Woodside will speak on "Courtship and Mating in an Urban Community." All interested in the subjects are invited to attend.

The Medical Society of London has arranged the following course of lectures to be given at 11, Chandos Street by Fellows of the society to any demobilized medical officers who may wish to attend. Each lecture will begin at 5.30 p.m.: Tuesday, Jan. 15, "The Acute Abdomen," Mr. V. Zachary Cope; Friday, Jan. 18, "Surgical Diseases of the Bladder," Mr. E. W. Riches; Tuesday, Jan. 22, "Infections of the Hand," Mr. R. M. Handfield-Jones; Friday, Jan. 25, "Gastro-enteritis of Children," Dr. C. F. Harris; Tuesday, Jan. 29, "Oesophagus," Prof. G. Grey Turner; Friday, Feb. 1, "Diagnosis and Treatment of Diabetes," Dr. Wilfred Oakley; Tuesday, Feb. 5, "Thyrotoxicosis," Dr. T. Jenner Hoskin, F.R.C.P.; Friday, Feb. 8, "Toxaemia of Pregnancy," Mr. Aleck Bourne; Tuesday, Feb. 12, "Disorders of Menstruation," Mr. A. C. Palmer; Friday, Feb. 15, "Indications for Chest Surgery," Mr. A. Tudor Edwards; Tuesday, Feb. 19, "Ophthalmic Emergencies," Mr. F. A. Williamson-Noble; Friday, Feb. 22, "Otitis Media," Mr. W. M. Mollison; Tuesday, Feb. 26, "Brachial and Sciatic Pain," Dr. Anthony Feiling; Friday, March 1, "The Pneumonias," Dr. Geoffrey Marshall; Tuesday, March 5, "Nephritis and Hypertension," Dr. Horace Evans.

The Ministry of Health announces that the Rushcliffe Committee has decided that the new scales of salaries for ward sisters, staff nurses, and assistant nurses comes into operation from Jan. 1, 1946. The estimated cost of the increases is roughly £500,000 a year to begin with, rising to £1,000,000 a year from April 1, 1947. The Rushcliffe Committee has also agreed that extra allowances should be paid for continuous service in pulmonary tuberculosis hospitals. Qualifying service for these allowances will be reckoned from Jan. 1. In informing local authorities and voluntary hospitals of these recommendations, the Minister of Health "warmly welcomes" them. He states that half the additional cost will be met by Exchequer grant (pending settlement of the post-war health services) on condition that employing authorities implement the Rushcliffe Committee's salary recommendations in full.

Dr. E. D. Pridie, C.M.G., D.S.O., O.B.E., has been appointed health expert at His Majesty's Embassy, Cairo.

Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Aitiology Westcent, London* ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

ANY QUESTIONS?

Age of Descent of Testes

Q.—*What is the latest age at which testicles have been known to descend into the scrotum (1) without special therapy, and (2) with special endocrine therapy?*

A.—In the case of patients with retained testes who are otherwise normal and show no endocrine stigmata, if the testicle does not descend before puberty (12 to 14 years of age) it is unlikely to do so, either spontaneously or with endocrine therapy, at a later date. Such a testis is probably ectopic. Where, however, an undescended testis is part of an endocrine syndrome—e.g., Fröhlich's syndrome—gonadotrophic hormone may produce descent in adolescence or adult life, but spontaneous descent is less likely. In the case of an ectopic testis surgery will be required.

Von Gierke's Disease

Q.—*What treatment would you recommend for von Gierke's disease in a patient aged 12?*

A.—The disease in question appears to be an inborn error of glycogen metabolism; this storage product is not mobilized readily to keep up the blood-sugar demand, and therefore accumulates in the tissues, especially, of course, the liver. Little has been added to the knowledge of the exact mechanism at fault since the original description. No treatment appears to be of any avail, but in view of the effect of adrenaline in mobilizing liver glycogen in normal subjects it might be worth trying regular small doses of ephedrine.

Tests for Addison's Disease

Q.—*Might insulin-sensitivity tests be useful in the early diagnosis of Addison's disease, as in Simmonds's disease? Hypoglycaemia is known to be a feature of exacerbations, and the adrenal is known to produce an "anti-insulin" substance.*

A.—Insulin-sensitivity tests might be useful, but normal findings would not contraindicate Addison's disease. This is because (1) the carbohydrate metabolism may be normal in the early phases of Addison's disease, and sometimes even in the later phases; and (2) because the diabetogenic or anti-insulin function of the pituitary gland has been shown to operate even in the absence of the adrenal glands, although part of this action may be indirectly through the adrenal glands. The writer has carried out insulin-sensitivity tests in Addison's disease, and the results, broadly speaking, appear to be half-way between the normal response and that obtained in Simmonds's disease. In his opinion, there are more useful tests in the diagnosis of Addison's disease, of which the most valuable is that of Kepler (F. J. Robinson, M. H. Power, and E. J. Kepler, *Proc. Mayo Clin.*, 1941, **16**, 577), which measures water and chloride metabolism and excretion.

Qualifications for Assistant M.O.H.

Q.—*What are the legal and technical qualifications necessary for an assistant to a medical officer of health of a population of 40,000 or over, or, in the case of Northern Ireland, an assistant to a medical superintendent officer of health? Is a D.P.H. or equivalent qualification essential?*

A.—No qualifications are prescribed for the post of assistant medical officer of health. The employing authority can require any qualifications which it thinks desirable. It may be assumed that an applicant must be a duly qualified medical practitioner, and if he is to be in charge of a specialized subdepartment in England and Wales he must hold the qualifications prescribed by the Local Government (Qualifications of Medical Officers and Health Visitors) Regulations, 1930, the details of which are too numerous to be dealt

with in a short answer. Such specialized appointments are unlikely to be made in an area the population of which is as low as 40,000. As already indicated, the D.P.H. is not a prescribed qualification for these posts, but if a medical officer aspires to become in time a medical officer of health he will require such a qualification, and it may be difficult for him to obtain it after he has entered the service as a whole-time officer. For this reason a very large proportion of all men or women entering the public health service in junior posts have made a practice of obtaining a public health qualification before seeking appointment as an assistant.

Inheritance of Patent Foramen Ovale

Q.—*A patient aged 34 has had two infants with a patent foramen ovale and both died. What are the chances of this woman's producing another child with (a) a patent foramen ovale, and (b) any congenital defect?*

A.—There is no definite evidence that patent foramen ovale is inherited, but it is almost certain that patent ductus arteriosus is inherited as a recessive, and the fact that other congenital heart lesions have occurred in more than one member of a sibship suggests that they too are inherited. It would be reasonable, therefore, to assume that the chances of another child having a patent foramen ovale are one in four, and this would be almost certain if the parents are consanguineous. It is improbable that any other congenital defect will occur.

Morphine and Adrenaline in Bronchial Asthma

Q.—*In bronchial asthma 1 in 1,000 adrenaline, 0.5 c.cm., hardly ever relieves the attack. Injecting in drop doses as recommended recently is hardly practicable in private practice. Should morphine be resorted to, and, if so, is there not the danger that repeated morphine injections will lead to addiction? Apart from this, does morphine really involve the risk of suffocation by abolishing the cough reflex? How should cases that resist adrenaline be treated?*

A.—The injection of 3 to 5 minims (0.18 to 0.30 c.cm.) of adrenaline usually relieves a paroxysm of asthma, particularly if given early. Bad attacks may be controlled by repeating this dose every three or four hours, or by the method of continuous injection. These methods can be taught to intelligent patients or their relations. If the attack is not controlled in this way the patient is ill enough to be in hospital or at any rate to have a nurse. Morphine is the drug of choice for cardiac asthma, but it is most dangerous in bronchial asthma, particularly in patients who are to be left. It is liable to cause death from acute respiratory failure. This is a much more real risk than addiction. The physician should ask himself why the attack is resistant to adrenaline. It may be that a bronchial infection is present, and if so one of the sulphonamides or penicillin may give relief. In other cases the reason may be an emotional upset, and solution of the mental problem will help. Failing these possibilities, the drug to use if adrenaline has not succeeded is aminophylline, gr. 7½ (0.5 g.), given very slowly intravenously, once or twice daily. Large doses of iodides or ammonium chloride may be used to loosen the tenacious sputum. Other measures include inhalations of steam, asthma powder, oxygen, oxygen and helium, etc. In very refractory cases bronchoscopy has been used to dislodge the mucus which is plugging the bronchi. If the patient cannot sleep, a barbiturate, or chloral and bromide, should be administered by mouth, or in bad cases avertin by rectum. Any of these appears safer than morphine in bronchial asthma.

INCOME TAX

Car Expenses—Assistant M.O.H.

"PHI" receives a mileage allowance of about £100 a year from his local authority, but he is considerably out of pocket as this makes no provision for depreciation. Should he take up the matter with the income-tax office?

*** The fundamental point is the application of the statutory rule that to be allowable under Schedule E expenses must be "incurred wholly, exclusively, and necessarily in the performance of the duties of the office." It follows that if "Phi" uses a more expensive car than can reasonably be said to be "necessary" for his duties he cannot legally claim the full cost of running it (including depreciation, etc.) and the local authority's allowance may be enough to meet the cost of a car of the size and power which is "necessary." A claim that the allowance is insufficient is tantamount to claiming that the authority is not paying such a sum as "Phi" must necessarily incur, and we are not aware of any case in which such a contention has been successful for income-tax purposes. There may, however, be a special circumstance under present conditions—i.e., "Phi" may have had to acquire a car on the present high cost basis, though the scale allowance may be on a pre-war basis. If that is the case we consider that the allowance is demonstrably too low and "Phi" might press for a deduction from his salary on those special grounds.

LETTERS, NOTES, ETC.

Use of Liver Extracts

Dr. JOHN MILLS (Reading) writes: In "Any Questions?" (Oct. 6, p. 482; Nov. 17, p. 714; Dec. 1, p. 794) the use of liver extracts in the treatment of anaemia is discussed. Since 1930 I have had under continuous observation some 250 patients suffering from pernicious anaemia. I have tested various extracts on these patients both in relapse and under maintenance and have recorded the following observations. (1) No advantage is gained by the massive dosage in relapse advised on Oct. 6. The refined extracts I have tested have given satisfactory results on a dosage of 4 c.cm. once a fortnight, and lately I have been using a dosage of 1 c.cm. a fortnight of a certain refined extract. The crude extract used more recently has been given in an initial dose of 4 c.cm. on two successive days, and thereafter 2 c.cm. a week or 4 c.cm. a fortnight. (2) It does not follow from the observation that an extract is very active in curing a relapse that it will be satisfactory when used for maintenance treatment after the haemoglobin level has reached the normal. (3) Two crude extracts have been used over long periods for maintenance—campolon 5 c.cm. each month and plexan 2 c.cm. each month in 90% or 4 c.cm. each month in 10% of patients. Whilst on this dosage of these extracts no patient has relapsed. Several refined extracts have been used in the dosage recommended by the manufacturers and invariably several of the patients so treated have relapsed, and increasing the dose has in many cases not restored the patient to a satisfactory condition.

My conclusions are: Crude extracts are better than refined extracts, and, since massive dosage does not cure the patient more quickly, there is no justification for using it. I have suspected that unnecessarily large or frequent doses may play some part in rendering the patient sensitive to liver extracts. Testing liver extracts for maintenance value is a slow process. Certainly the answer cannot be obtained in less than two years, and I would prefer the test to run three years. Many patients must be used for each test; hence it has not been possible to test a large number of crude extracts. A greater number of refined extracts has been tested for the simple reason that the patients have relapsed and the answer been obtained usually by the end of the first year.

"He Died Peacefully . . ."

Dr. JOHN CAHILL (Middlesbrough) writes: With regard to the query under the above heading (Nov. 17, p. 712), I venture to advance the opinion that most people, at the end, die peacefully, but they hardly ever die in their sleep. At the average deathbed one witnesses a stage of agitation (accompanied, sometimes, by hallucinations, and, occasionally, by what appear to be genuine religious experience) followed by a stage of stupor deepening into coma. In deaths of catastrophic type these two stages may be of extremely brief duration and, at the other end of the scale, as in chronic uraemia, the stupor-coma stage may last for days. Thus there is no abrupt transition from consciousness to dissolution. Indeed, Disraeli showed acute perception when he wrote: "Death is most dreadful at a distance—illness weakens the mind in a wise proportion with the body."

A Missing Medical Officer

Mrs. MCLELLAN (The Knowe, Mauchline, Ayrshire) would be grateful to any reader who can give information of her husband, Capt. Archibald McLellan, 159919 R.A.M.C., who has been missing in Burma since March, 1942. Capt. McLellan was wounded in that month and sent to Mandalay, but he did not arrive there and was believed to have been seen at Magwe awaiting air transport to India. The War Office state that he did not arrive in India, nor has he been found in any prison camp.

Initials

Mr. R. K. HOWAT, F.R.C.S., writes from Highgate: In your issue of Dec. 15 there is an article, "A Fatal Case of D.D.T. Poisoning in a Child," in the course of which the poisonous agent is referred to by initial letters twenty-nine times, in words not once. To one who was brought up on a technical nomenclature of words, not initial letters, this article seems an example *in excelsis* of a practice that would be welcome *in extremis*. By the way, what is D.D.T.?

*** Dichlor-diphenyl-trichorethane, for short. The full chemical name—2,2-*bis* (*p*-chlorphenyl) 1,1,1-trichlorethane—was given in the title and also in the first sentence of the preceding article on page 842 of the same issue.—ED., *B.M.J.*

Correction

Dr. C. HAMILTON WILKIE writes: In my letter (Dec. 22, p. 900) on the treatment of early syphilis "ten twice-weekly injections" should have read "ten double weekly injections." In other words, two injections are given at one attendance each week for ten weeks.